Ventura County
Watershed Protection District
Water Resources Division

2018 Annual Report of Groundwater Conditions

Ventura County
Watershed Protection District
Water Resources Division

MISSION:

"Protect, sustain, and enhance
Ventura County watersheds now
and into the future for the benefit of
all by applying sound science,
technology, and policy."

2018 Annual Report of Groundwater Conditions

Cover Photo: Irrigation well in the Fillmore Subbasin

Ventura County Watershed Protection District
Water Resources Division
Groundwater Section

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Table of Contents

List of Figures

List of Tables

Executive Summary

Groundwater is the primary water source in Ventura County, providing approximately 63% of the total water for domestic, agricultural and industrial uses. Agricultural use accounts for the majority of groundwater consumption. The County provides protection for groundwater quality and supply through Well Ordinance No. 4468 by regulating the construction, maintenance, use and destruction of wells and engineering test holes (soil borings) in such a manner that the groundwater of the County will be of beneficial use without jeopardizing the health, safety or welfare of the people of Ventura County.

After an above-average rainfall year in 2017, calendar year 2018 saw below-average rainfall throughout the County. In January, the County was designated as an area of moderate drought but by the end of the year the designation had been changed by the U.S. Drought Monitor (http://droughtmonitor.unl.edu) to an area of severe drought. The drought along with regulatory constraints led to a decrease in surface water releases and diversions. When less surface water is available, local groundwater demand increases. After extended drought and below average precipitation, groundwater elevations were mixed, with many having increased but others showing a continuing decline.

Water quality trends within County basins were generally unchanged from previous years. Key water quality concerns in some basins continue to be high concentrations of total dissolved solids (TDS) and nitrate; both exceeding the maximum contaminant level (MCL) in localized areas within specific basins. Basin summary sheets included in the appendices include analyses of water level and water quality trends over a five-year period.

The County of Ventura does not regulate groundwater extractions. Extractions are regulated by three groundwater management agencies (GMAs) in specific areas of the County: the Ojai Basin Groundwater Management Agency (OBGMA), the Fox Canyon Groundwater Management Agency (FCGMA), and United Water Conservation District (UWCD). These agencies cover approximately 8% of the land area in Ventura County. Well owners and operators within the statutory boundaries of an agency are required to report extractions to their respective agency. Groundwater extractions outside of a GMA boundary are often unreported with total County-wide extractions unknown.

Several basins within the County have been designated as critically-overdrafted by the California State Department of Water Resources (DWR). Legislation passed by the California State Assembly in 2014 aims to change the way groundwater is managed. The Sustainable Groundwater Management Act (SGMA) is a tripartite legislation that requires Groundwater Sustainability Agencies (GSAs) to form in all DWR-designated high and medium priority basins. GSAs exist in all high and medium priority basins within the County and are working to develop Groundwater Sustainability Plans (GSPs) to manage groundwater supplies. In 2014, the County passed an emergency ordinance (No. 4466) temporarily banning new groundwater wells in high and medium priority basins (referred to as the New Well Moratorium Area). The emergency ordinance was established to protect groundwater after a spike in new well application submittals following SGMA legislation. The Well Moratorium will expire in a basin when its respective GSA submits the required GSP' to the DWR.

This report provides a summary of Calendar Year 2018 water quality and groundwater elevations for the groundwater basins of Ventura County.

1.0 Introduction

The Ventura County Watershed Protection District (VCWPD) was formed on September 12, 1944, as the "Ventura County Flood Control District." Since 2003, it has been known as the VCWPD. The Groundwater Resources Section is part of the VCWPD and has collected groundwater data since 1928. Historically, groundwater data was published in Triennial or Quadrennial reports in a collaborative effort with the Flood Control District, Hydrology Section. The last such report was published in December 1986 and covered the years 1981 through 1984. Between 1985 and 2004, Groundwater Resources Section drafted several unpublished Groundwater Conditions Reports. In 2006, Groundwater Resources Section published its first *Groundwater Quality Report* for the years 2005 and 2006. The *2018 Annual Report of Groundwater Quality* (Annual Report) is the 13th consecutive publication.

The purpose of this report is to provide information on groundwater conditions in Ventura County and to publish the results of the quarterly groundwater elevation measuring of approximately 200 wells and Fall groundwater quality sampling of water supply wells.

This report is prepared annually due to changing groundwater conditions and fluctuating seasonal conditions. Basin summary sheets in **Appendix F** provide a single-page summary of water level and quality trends along with other key data over a five-year period. Detailed water quality and water level data are presented for each basin. Laboratory analytical results and supporting data are included in the appendices.

1.1 Geography and County Information

Ventura County was formed on January 1, 1873, when it separated from Santa Barbara County and became one of 58 counties in the State of California. The county constitutes 42 miles of coastline, the Los Padres National Forest situated in the northern portion of the County, and fertile valleys and plains in the southern half of the County. The County was ranked eighth among California counties in total crop value in 2017[1] and eleventh among all Counties in the United States[2]. Together, farming and the Los Padres National Forest occupy half of the County's 1.2 million acres.

1.2 Population

The unincorporated areas, along with the ten incorporated cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks, and San Buenaventura (Ventura), rank Ventura as the 11th most populous county in the State. On May 1, 2018, the California State Department of Finance estimated Ventura County's population to be 859,073, an increase of 0.4 percent over the revised 2017 population estimate of 855,910. Fillmore and Moorpark had the largest estimated percentage increase in population (1%) over the previous year. The County's population is expected to exceed 900,000 by the year 2025.

[1] California Department of Food and Agriculture *California Agricultural Statistics Review 2017-2018*
[2] Farm Bureau of Ventura County

2.0 County Well Ordinance

The first County Water Well Ordinance was adopted by the Ventura County Board of Supervisors in 1970 and has since undergone six revisions. The current Well Ordinance was last updated in December 2014 (No. 4468) to better align with the State of California Sustainable Groundwater Management Act (SGMA).

The Well Ordinance provides for protection of groundwater quality and supply so that groundwater will be suitable and sustainable for beneficial use and not jeopardize the health of the people of Ventura County. This includes issuing well permits and inspecting the installation and destruction of wells. Quarterly water level measurements, annual water quality sampling, groundwater basins condition reporting, review of development projects, and provision of water quality and well information are carried out to better support the purpose of the Well Ordinance.

2.1 Permits

Permits are required for construction, repair, and destruction of groundwater wells, cathodic protection wells, monitoring wells, and geotechnical borings (engineering test holes). The permits are required to ensure wells and borings are constructed and sealed per California DWR Well Standards[3].

Permits are issued throughout the County, except within the City of Oxnard which issues well permits within its city boundaries. 94 permits for wells and engineering test holes were conditioned and issued during calendar year 2018.

2.2 Well Inspections

Per the Well Ordinance, well seals are inspected for each water supply well installation or destruction, cathodic protection well installation or destruction, and major modifications or repairs to existing water supply wells.

2.3 Well Inventory and Status

At the end of 2018 there were 9,255 County well records in the categories listed in **Table 2-1**.

Table 2-1: Well inventory and status

2018 Status	Number
Active	4,130
Abandoned	416
Can't Locate	1,837
Non-Compliant	70
Non-Compliant Abandoned	121
Destroyed	2,672
Exempt	9

- Active wells meet or exceed the minimum requirement of 8 hours pumping per calendar year as described in the County of Ventura Well Ordinance No. 4468.
- Abandoned wells do not meet the 8-hour minimum pumping requirement or are in a condition that no longer allows the well to be used.
- Can't Locate wells are usually old rural wells for which the Groundwater Section has historic well location data but the locations may now be in areas that have subsequently been developed. There

[3]Department of Water Resources *California Well Standards, Bulletin 74-90*

are several reasons why a well may be listed as "Can't Locate." The current owner of the property may be unaware of the existence of a well on their property or an approved search has been conducted and no well has been found.

- Non-Compliant wells are generally active wells for which the responsible party failed to respond to written communication from the Groundwater Section.
- Non-Compliant Abandoned wells are classified as such when a well owner has failed to respond to written communication from the Groundwater Section to take action on an inactive well. The Well Ordinance prohibits anyone from owning an abandoned well. Abandoned wells pose a physical safety risk and may act as a potential conduit for contaminants to reach groundwater.
- Destroyed wells are wells that have been properly destroyed under permit.
- Exempt wells have been found to be in good enough condition to remain inactive for a period of five years before being re-activated or re-inspected. To be listed as exempt, a well inspection report from a licensed professional geologist or civil engineer must be submitted by the well owner to the Groundwater Section for review and approval.

3.0 Climate & Precipitation

The mean annual daily air temperature for 2018 at the National Weather Service Oxnard area office was 63.9 degrees Fahrenheit (ºF), with an average maximum high of 74.3ºF and an average minimum low of 53.6 ºF[4]. The average annual rainfall, countywide was approximately 8.91-inches[5] for the 2018 water year[6]. Throughout the County, precipitation for the 2018 water year was mostly below 50% of normal. Matilija Dam received 60.3% of normal, while the Fillmore area received 40.4% of the normal rainfall total. **Figure 3-1** shows water year 2018 received rainfall totals and normal precipitation totals for that gauge/area. Averages are determined from the 1957-1992 base period, as this is a 35-year period that is representative of the long-term average for multiple sites in Ventura County[7]. **Figure 3-2** depicts average rainfall for the periods from water year 1999 to 2018 for all of Ventura County. **Figure 3-3** shows a generalized distribution of rainfall across the County for water years with more precipitation (2010 and 2011) and **Figure 3-4** shows rainfall distribution for water years with less precipitation (2017 and 2018).

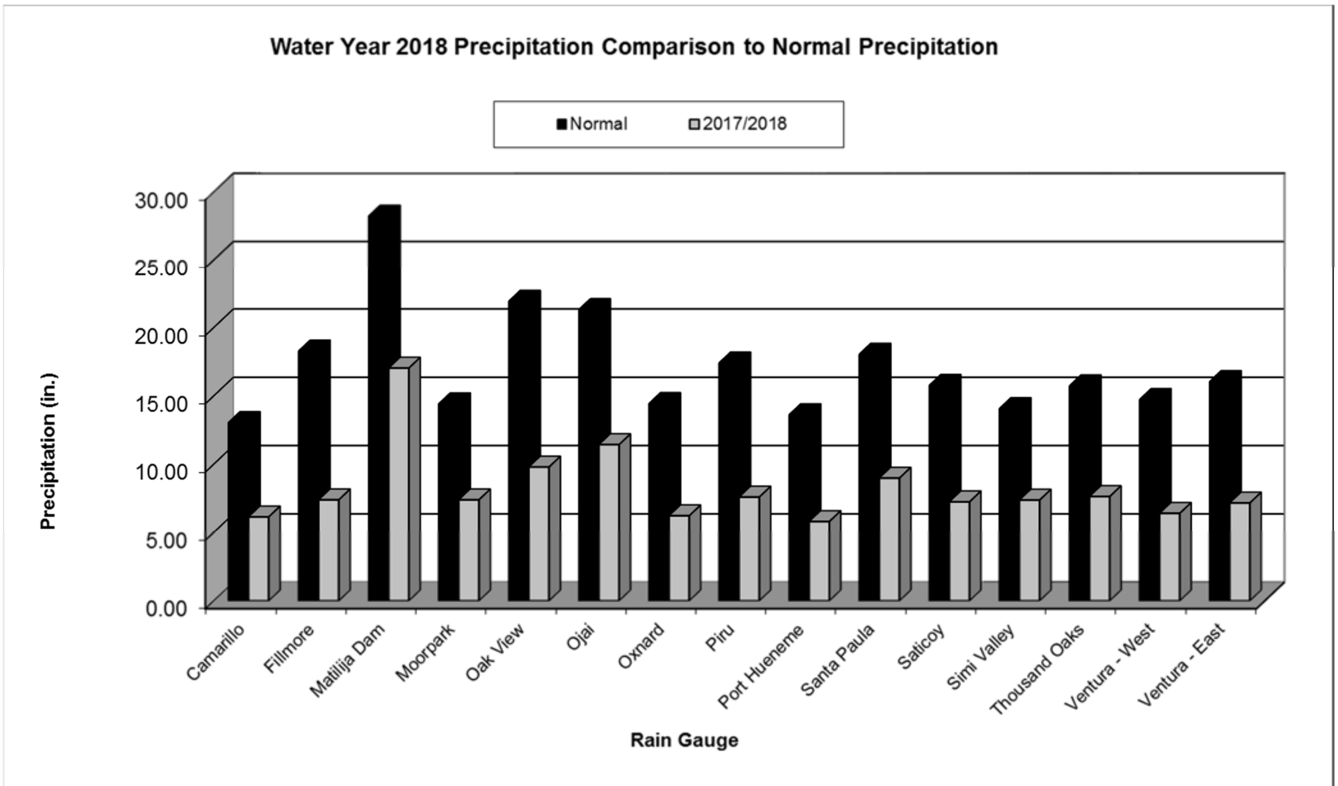


Figure 3-1: 2017/2018 precipitation and normal precipitation totals.

4 Based on *preliminary* data from the National Climatic Data Center http://www.ncdc.noaa.gov.

5 Based on *preliminary* data from all active rain gauges.

6 Water Year defined as: October 1 to September 30 of the following year. VCWPD precipitation data is *preliminary* and subject to change.

7 According to the Ventura County Hydrology Section's Historic Rainfall webpage.

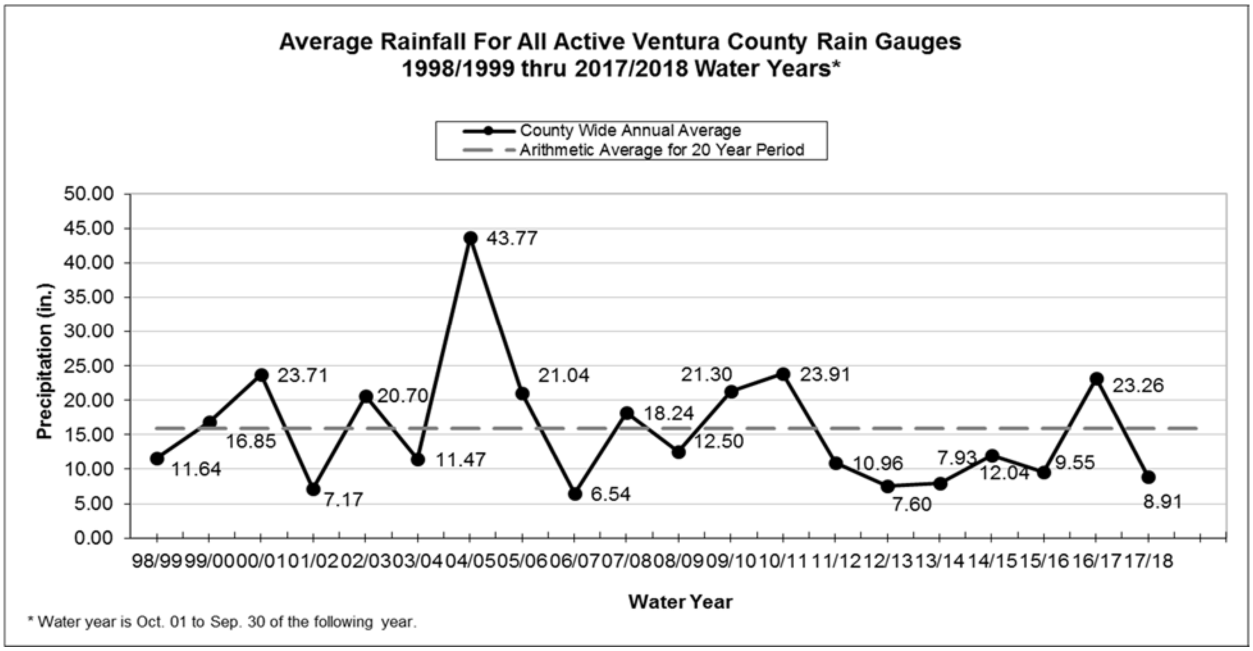


Figure 3-2: Average annual rainfall for Ventura County.

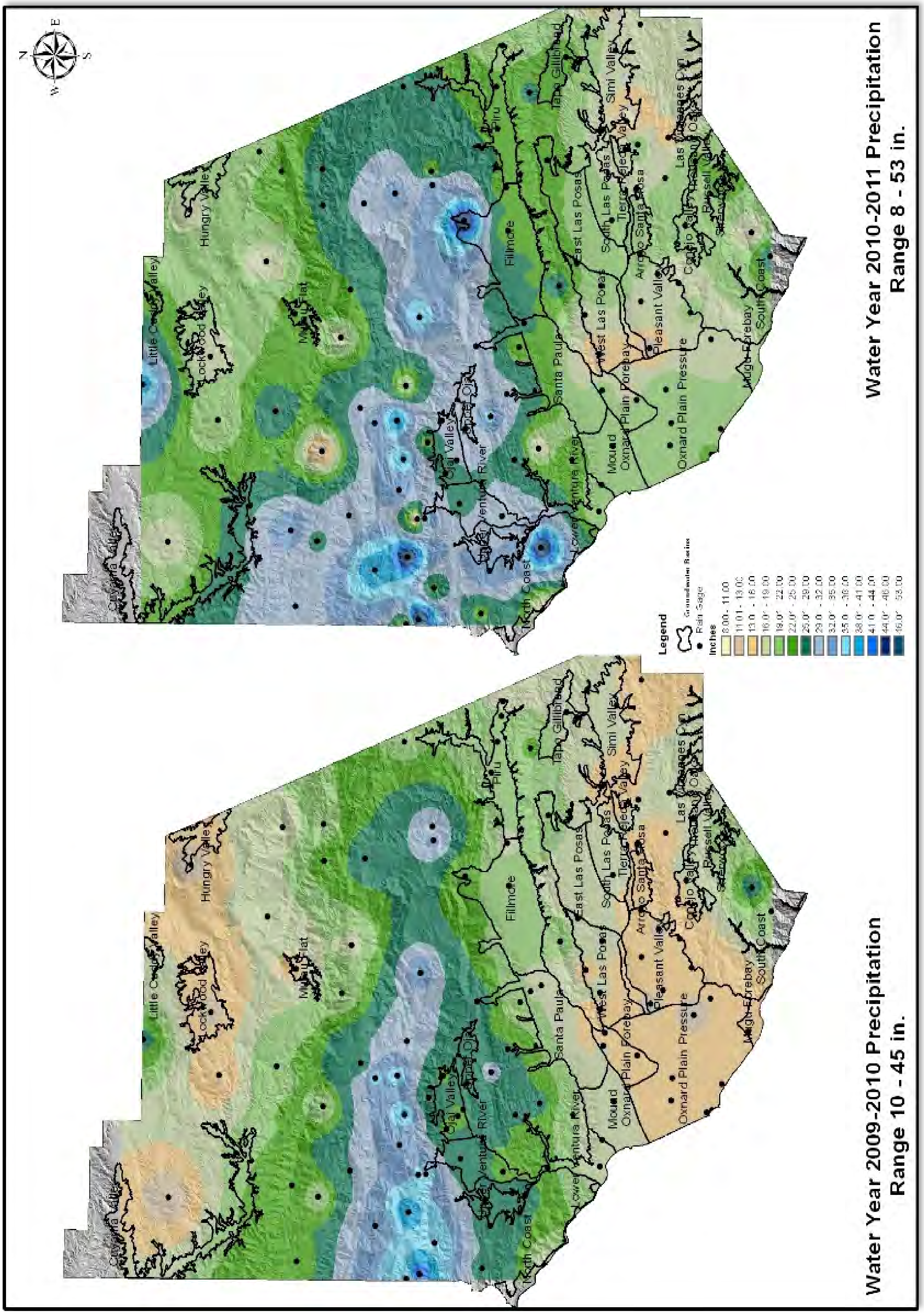


Figure 3-3: Precipitation maps of wet years.

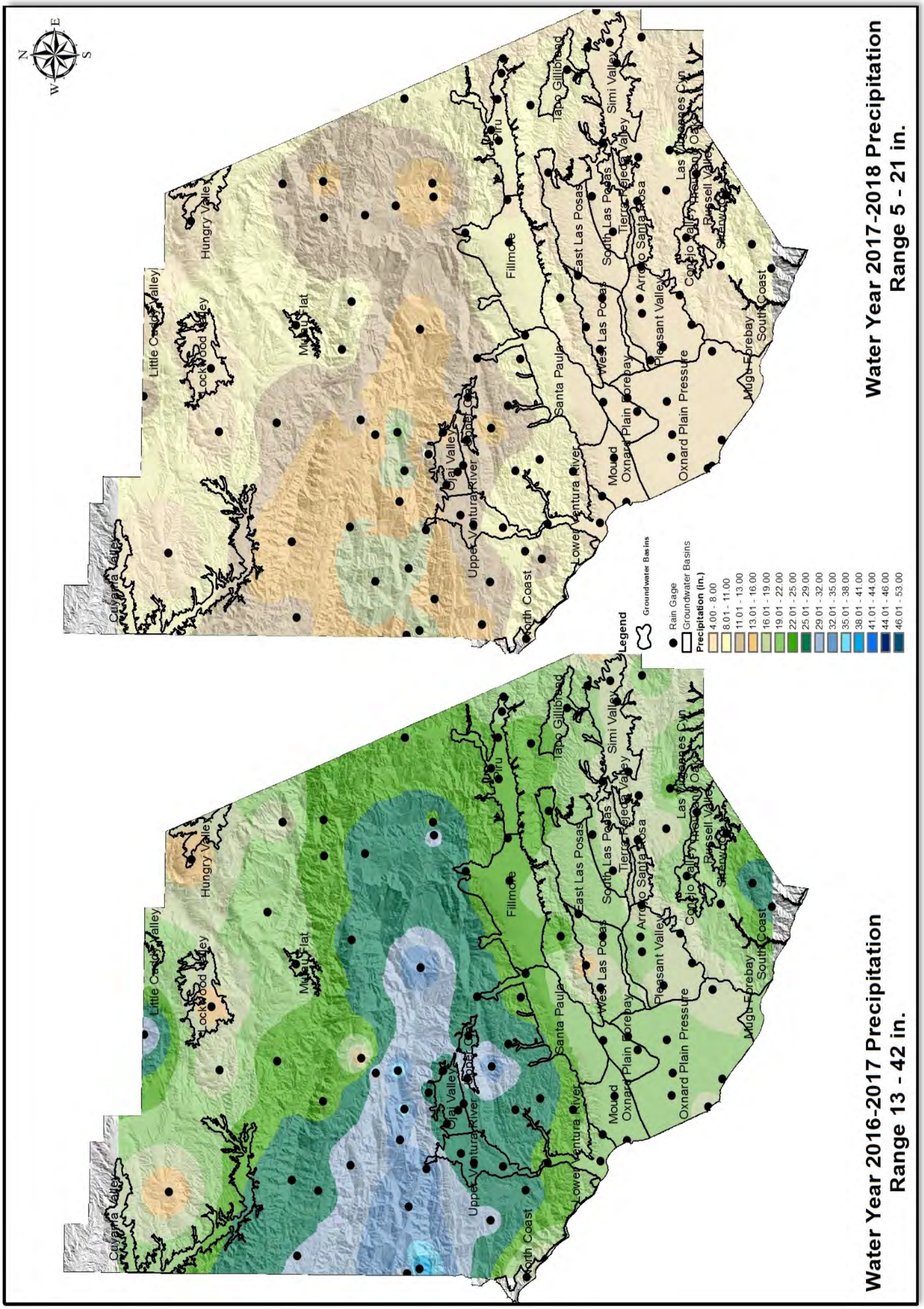


Figure 3-4: Precipitation maps of water years 2017 and 2018.

4.0 Groundwater

Most accessible groundwater is found in 28 groundwater basins and subbasins (**Figure 4-1**). The degree of interconnectedness of groundwater basins and aquifers within each basin is highly variable. Groundwater basins in the north half of the County do not join directly with other basins, while some groundwater basins in the south half of the County are connected on the surface and in the subsurface to varying degrees. Detailed basin descriptions are provided in their respective section.

The County and local agencies, individual water purveyors, and the USGS all collect groundwater data. Recharge of groundwater occurs naturally from infiltration of rainfall and river/streamflow, artificially through injection of imported water and spreading of diverted river water into recharge basins. Known groundwater extraction data within certain basins is presented later in this report along with extraction estimations from other basins.

Defined groundwater basins as shown in Department of Water Resources (DWR) Bulletin 118 (B118) Are used for the Annual Report. DWR Bulletin 118 basin boundaries are used to align with other agencies and avoid confusion.

Figure 4-1: Ventura County groundwater basins map.

4.1 Groundwater Quality Characterization

Groundwater contains a variety of chemical constituents at different concentrations. Flowing water assumes a diagnostic chemical composition from interactions with surrounding alluvium or bedrock. For most groundwaters, 95% of the ions are represented by positively charged cations sodium (Na+), potassium (K+), calcium (Ca2+), magnesium (Mg2+), and the negatively charged anions chloride (Cl-), carbonate (CO32-), bicarbonate (HCO3-), and sulfate (SO42-). These ionic species when added together account for most of the salinity that is commonly referred to as total dissolved solids (TDS). The Annual Report uses Piper and Stiff diagrams for basic characterization of the chemical composition of groundwater.

Piper Diagram

A piper diagram is a graph to visualize the chemistry of a water sample. The diagram is comprised of a ternary diagram in the lower left representing cations, a ternary diagram in the lower right representing the anions, and a diamond plot in the middle representing a combination of the two (composition) (**Figure 4-2**).

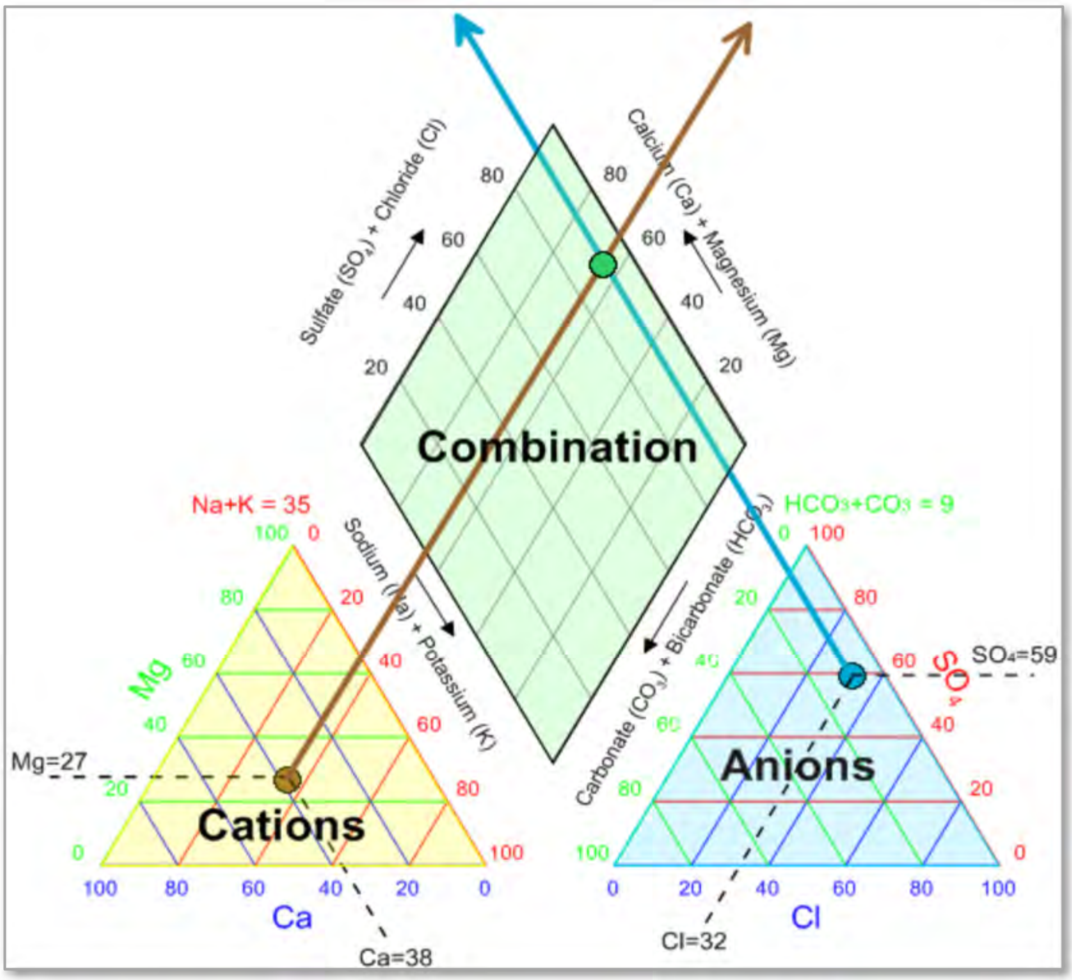
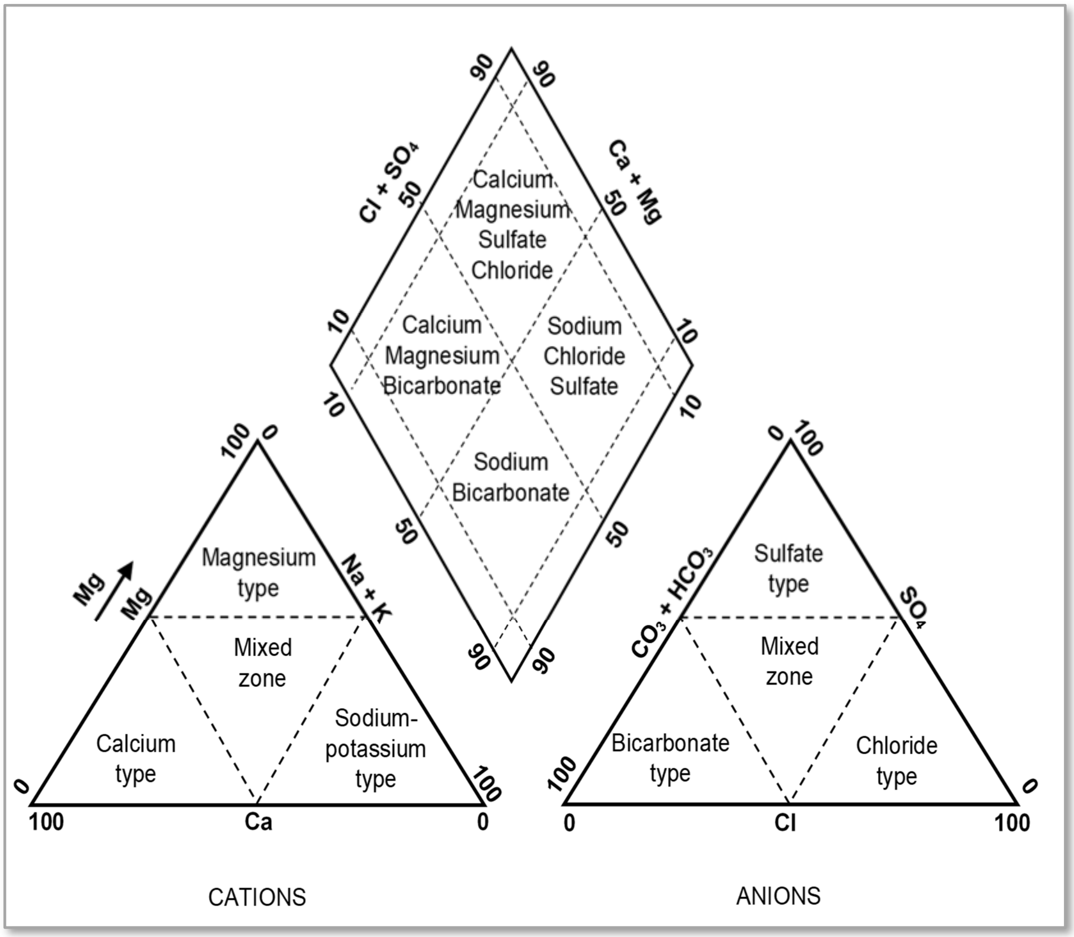


Figure 4-2: Example of a Piper diagram

In the example diagram in **Figure 4-2** the cations plot in the mixed zone in the lower left triangle and the anions plot in the sulfate zone in the lower right triangle. The plotted points are projected onto the diamond-shaped center field and show that the water is calcium sulfate type.

Groundwater samples are interpreted as illustrated in **Figure 4-3**:

- <u>top quadrant</u>: calcium sulfate waters – typically associated with gypsum and mine drainage
- <u>left quadrant</u>: calcium bicarbonate waters – typically shallow, fresh groundwater
- <u>right quadrant</u>: sodium chloride waters – typically marine and ancient groundwater
- <u>bottom quadrant</u>: sodium bicarbonate waters – typically deep groundwater influenced by ion exchange



<u>Figure 4-3:</u> Piper diagram with water types.

Figure 4-3 shows how a Piper diagram is used to characterize water quality. Anions (Cl-, CO32-, HCO3-, and SO42-) and cations (Na+, K+, Ca2+, Mg2+) are each grouped, and their respective concentrations calculated. The concentrations are converted to milliequivalents/L (meq/L) and normalized on a percentage scale. The percent concentrations are plotted on the lower ternary diagrams. The position of the points is projected parallel to the magnesium and sulfate axes, respectively, until they intersect in the center field (Fetter, 1988).

Piper diagrams for each basin are in **Appendix E**.

<u>Stiff Diagram</u>

A second method to present water quality results is through a stiff diagram (**Figure 4-4**). The same cations and anions that are plotted in the piper diagrams are shown in the stiff diagrams. The ions are plotted on either side of a vertical axis in milliequivalents per liter (meq/L), cations on the left of the axis and anions on the right. The polygonal shape created is useful in making a quick visual comparison of different water samples. Stiff diagrams for wells sampled this year are included on each basin map.

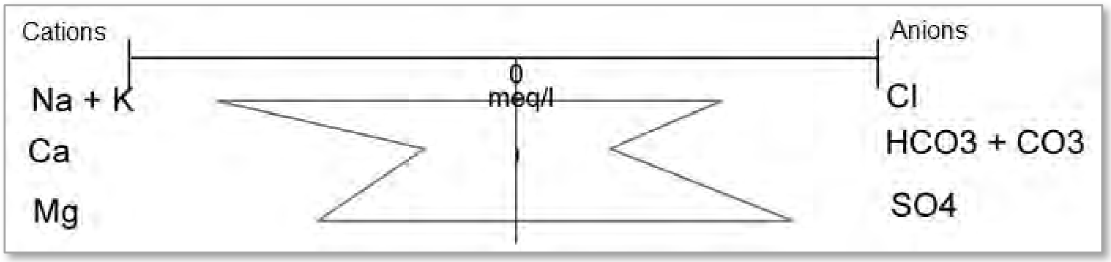


Figure 4-4: Example of Stiff Diagram.

4.2 Groundwater Quality Sampling

Water quality data is collected to assess groundwater quality within the County groundwater basins. Data from other organizations in the County is shared. Wells sampled in the north half of the County are shown in **Figure 4-5**. Wells sampled in the south half of the County are shown in **Figure 4-6**.

A total of 93 water supply wells were sampled throughout the County in 2018. Well owners are provided with a copy of the laboratory analysis and notified if any of the constituents analyzed exceed the State and Federal established maximum contaminant levels (MCLs).

Laboratory analyses are conducted by Fruit Growers Laboratory in Santa Paula, a laboratory certified under the State Environmental Laboratory Accreditation Program. All samples from wells were analyzed for general minerals with a random subset of 27 wells selected for analysis of California Title 22 metals.

Water quality sampling results are included in **Appendix D**. General interpretations of quality data are detailed in the following subsections.

Additional groundwater quality data is available from other sources, such as water districts and other agencies that collect and analyze groundwater. Organic groundwater chemistry data is also available for some areas of the County through the State Regional Water Quality Control Board's GeoTracker website for environmental cleanup sites (https://geotracker.waterboards.ca.gov/) .

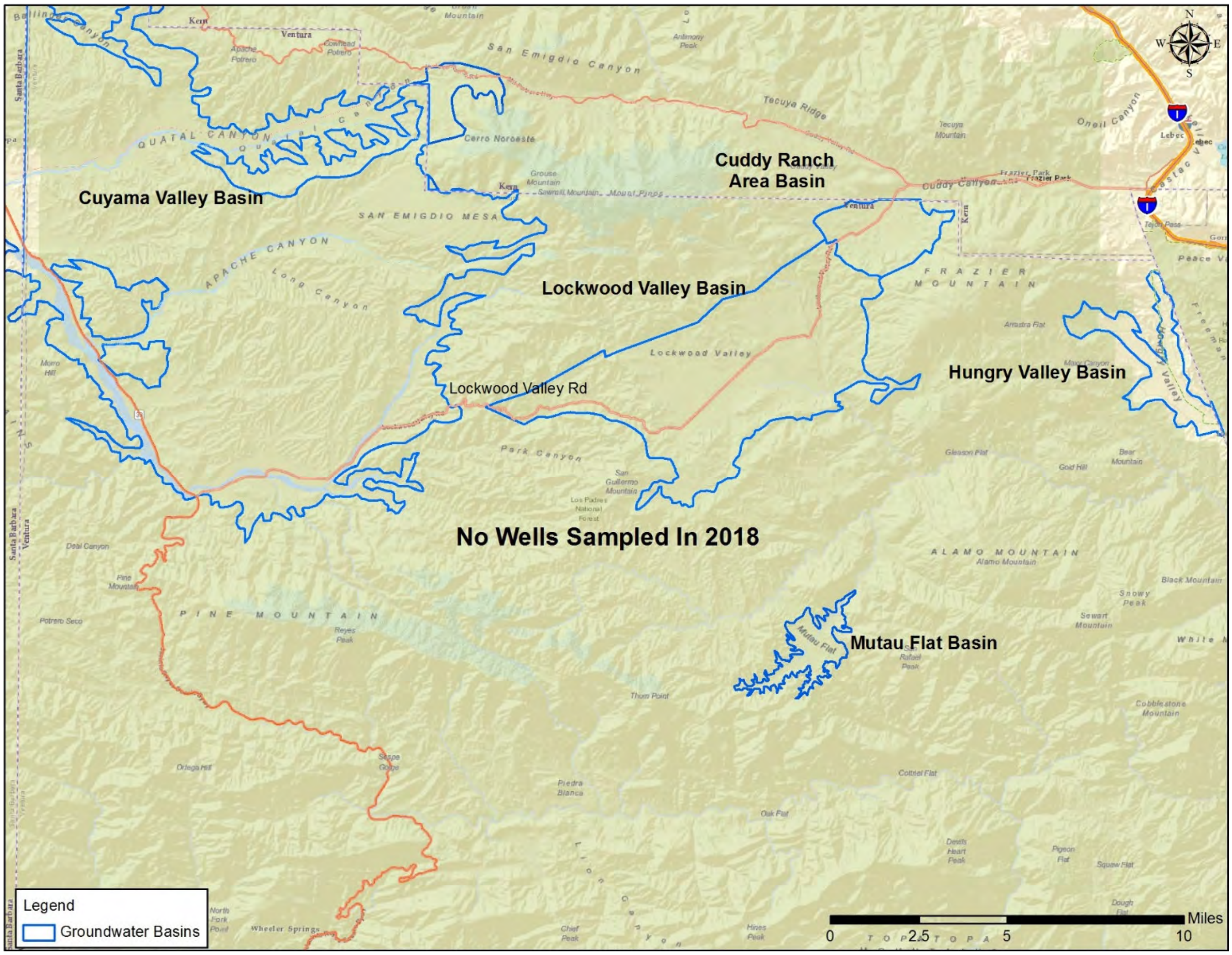


Figure 4-5: Location of wells sampled in north half of the County.

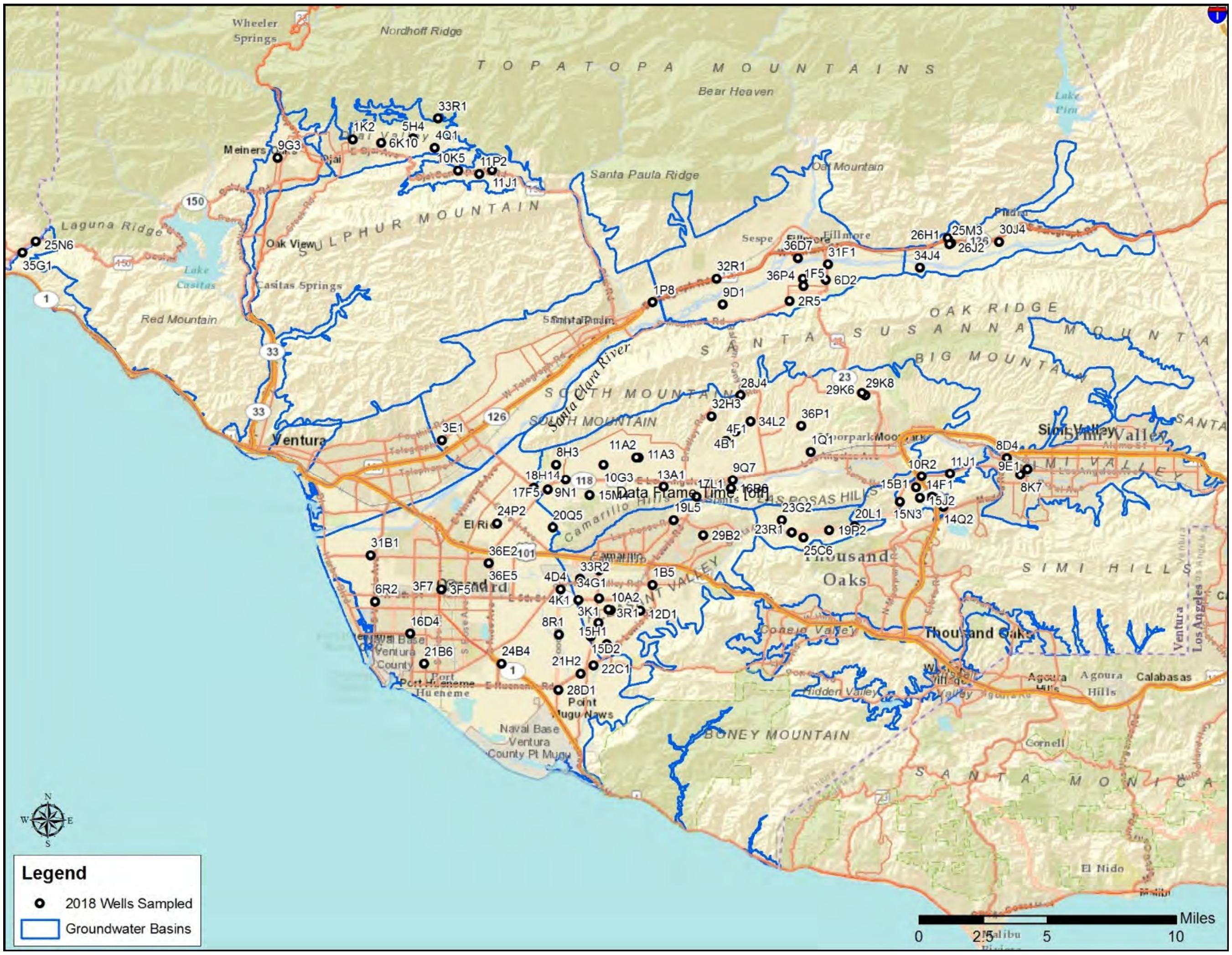


Figure 4-6: Location of wells sampled in south half of the County.

4.3 Water Quality Standards

The Groundwater Section uses Water Quality Standards established by the Los Angeles Regional Water Quality Control Board (LARWQCB) for assessing groundwater quality in Ventura County. Water Quality Standards provide for the reasonable protection and enhancement of surface and groundwater and consist of beneficial use and water quality objectives as mandated by the California Water Code (§13241). LARWQCB developed twenty-four defined beneficial uses, all of which are compiled in the *Basin Plan for the Coastal Watersheds of Los Angeles and Ventura County* (Basin Plan). Water quality objectives protect public health by maintaining or enhancing existing or potential beneficial uses of water.

The Basin Plan specifies Ventura County's narrative and numerical Water Quality Standards for groundwater and incorporates Title 22, California Code of Regulations (CCR) standards for groundwater by reference. These are referred to as primary MCLs. A primary MCL is the highest concentration of a contaminant allowed in drinking water that can be present without any adverse health effects. Primary MCLs developed by the State meet or exceed the United States Environmental Protection Agency (EPA) standards and are legally enforceable standards.

Los Angeles Regional Quality Control Board Table of Beneficial Uses of Ground Water by Basin for Ventura County

DWR[ad] Basin No.	BASIN	MUN	IND	PROC	AGR	AQUA
	PITAS POINT AREA[ae]	E	E	P	E	
4-1	UPPER OJAI VALLEY	E	E	E	E	
4-2	LOWER OJAI VALLEY-OJAI VALLEY	E	E	E	E	
4-3	VENTURA RIVER VALLEY					
4-3.01	Upper Ventura	E	E	E	E	
4-3.02	Lower Ventura	P	E	P	E	
4-4	SANTA CLARA RIVER VALLEY[af]					
4-4.02	Oxnard					
4-4.02	Oxnard Forebay	E	E	E	E	
	Confined aquifers	E	E	E	E	
	Unconfined and perched aquifers	E	P		E	
4-4.03	Mound					
	Confined aquifers	E	E	E	E	
	Unconfined and perched aquifers	E	P		E	
4-4.04	Santa Paula					
	East of Peck Road	E	E	E	E	
	West of Peck Road	E	E	E	E	
4-4.05	Fillmore					
	Pole Creek Fan area	E	E	E	E	
	South side of Santa Clara River	E	E	E	E	
	Remaining Fillmore area	E	E	E	E	E
	Topa Topa (upper Sespe) area	P	E	P	E	
4-4.06	Piru					
	Upper area (above Lake Piru)	P	E	E	E	
	Lower area east of Piru Creek	E	E	E	E	
	Lower area west of Piru Creek	E	E	E	E	

DWR[ad] Basin No.	BASIN	MUN	IND	PROC	AGR	AQUA
4-6	PLEASANT VALLEY[ag]					
	Confined aquifers	E	E	E	E	
	Unconfined and perched aquifers	P	E	E	E	
4-7	ARROYO SANTA VALLEY[ag]	E	E	E	E	
4-8	LAS POSAS VALLEY[ag]	E	E	E	E	
4-9	SIMI VALLEY					
	Simi Valley Basin					
	Confined aquifers	E	E	E	E	
	Unconfined aquifers	E	E	E	E	
	Gillibrand Basin	E	E	P	E	
4-10	CONEJO VALLEY	E	E	E	E	
4-15	TIERRA REJADA	E	P	P	E	
4-16	HIDDEN VALLEY	E	P		E	
4-17	LOCKWOOD VALLEY	E	E		E	
4-18	HUNGRY VALLEY	E	P	E	E	
4-19	THOUSAND OAKS AREA[aj]	E	E	E	E	
4-20	RUSSELL VALLEY	E	P		E	
4-21	CONEJO-TIERRA REJADA VOLCANIC[ak]	E			E	

Footnotes are consistent for all beneficial use tables.

E: Existing beneficial use.

P: Potential beneficial use.

ac: Beneficial uses for ground waters outside of the major basins listed on this table and outlined in Fig 1-9 have not been specifically listed. However, ground waters outside of the major basins are, in many cases, significant sources of water. Further existing sources of water for downgradient basins, and such, beneficial uses in the downgradient basins shall apply to these areas.

ad: Basins are numbered according to DWR Bulletin No. 118-Update 2003 (DWR, 2003).

ae: Ground waters in the Pitas Point area (between the lower Ventura River and Rincon Point) are not considered to comprise a major basin and, accordingly, have not been designated a basin number by the DWR or outlined on Fig. 1-9.

af: Santa Clara River Valley Basin was formerly Ventura Central Basin and Acton Valley Basin was formerly Upper Santa Clara Basin (DWR, 1980).

ag: Pleasant Valley, Arroyo Santa Rosa Valley, and Las Posas Valley Basins were formerly subbasins of Ventura Central (DWR, 1980).

ah: Nitrite pollution in the groundwater of the Sunland-Tujunga area currently precludes direct MUN uses. Since the ground water in this area can be treated or blended (or both), it retains the MUN designation.

ai: Raymond Basin was formerly a subbasin of San Gabriel Valley and Monk Hill subbasin is now part of San Fernando Valley Basin (DWR, 2003). The Main San Gabriel Basin was formerly separated into Eastern and Western areas. Since these areas had the same beneficial uses as Puente Basin all three areas have been combined into San Gabriel Valley. Any ground water upgradient of these areas is subject to downgradient beneficial uses and objectives, as explained in Footnote ac.

aj: These areas were formerly part of the Russell Valley Basin (DWR, 1980).

ak: Ground water in the Conejo-Tierra Rejada Volcanic Area occurs primarily in fractured volcanic rocks in the western Santa Monica Mountains and Conejo Mountain areas. These areas have not been delineated on Fig. 1-9.

al: With the exception of ground water in Malibu Valley (DWR Basin No. 4-22) ground waters along the southern slopes of the Santa Monica Mountains are not considered to comprise a major basin and accordingly have not been designated a basin number by DWR.

am: DWR has not designated basins for ground waters on the San Pedro Channel Islands.

State MCLs for inorganic chemicals (Title 22 Metals) and their potential health effects are listed in **Table 4-1**. The EPA MCLs are listed for informational purposes but are not used to describe groundwater quality in the Annual Report. State and EPA Primary MCLs for radionuclides are listed in **Table 4-2**.

The Basin Plan also states that groundwater shall not contain “taste or odor-producing substances” that “cause nuisance or adversely affect beneficial uses.” These are known as Secondary Maximum Contaminant Levels (SMCLs) (**Table 4-3**). SMCLs do not pose a threat to human health and are set to a level at which most people will physically notice their presence in drinking water. Secondary MCLs assist in managing drinking water for aesthetic considerations (taste, odor and color) and are enforceable standards in California.

Table 4-1: Primary maximum contaminant levels for Title 22 metals.

Primary Contaminants	Chemical Formula	EPA MCL[1] (mg/L)[2]	CCR, Title 22 MCL (mg/L)	Potential Health Effects
Aluminum	Al	not established	1.0	Unknown. Some studies show exposure to high levels may cause Alzheimer's, but other studies show this not to be true.

Primary Contaminants	Chemical Formula	EPA MCL[1] (mg/L)[2]	CCR, Title 22 MCL (mg/L)	Potential Health Effects
Antimony	Sb	0.006	0.006	Increase in blood cholesterol; decrease in blood sugar
Arsenic	As	0.01	0.01	Skin damage or problems with circulatory systems and potential increased risk of developing cancer.
Asbestos	various	7 MFL[3]	7 MFL	Increased risk of developing benign intestinal polyps.
Barium	Ba	2	1	Increase in blood pressure.
Beryllium	Be	0.004	0.004	Intestinal lesions.
Cadmium	Cd	0.005	0.005	Kidney damage.
Chromium	Cr	0.1	0.05	Allergic dermatitis.
Copper	Cu	1.3	1.3	Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage
Cyanide (as free cyanide)	CN^-	0.2	0.15	Nerve damage or thyroid problems.
Fluoride	F^-	4	2	Bone disease (pain and tenderness of the bones); Children may get mottled teeth.
Lead[4]	Pb	0.015	0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities. Adults: Kidney problems; high blood pressure.
Mercury	Hg	0.002	0.002	Kidney damage.
Nickel	Ni	not established	0.1	Allergic contact dermatitis most common.
Nitrate (as Nitrogen) NO_3^-	N	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
Nitrate[5]	NO_3^-	Listed as Nitrate-N	45	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
Nitrite (as Nitrogen) NO_2^-	N	1	1	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

Primary Contaminants	Chemical Formula	EPA MCL[1] (mg/L)[2]	CCR, Title 22 MCL (mg/L)	Potential Health Effects
Selenium	Se	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems.
Thallium	Tl	0.002	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems.

[1]MCL = Maximum Contaminant Level.

[2]mg/L = milligrams per liter.

[3]MFL = Million fibers per liter, with fiber length >10 microns.

[4]Regulatory action level.

[5]CCR, Title 22 standard for Nitrate reported as NO_3

Table 4-2: Primary maximum contaminant levels for radionuclides

Radionuclide	Chemical Formula	CCR, Title 22 MCL[1]	EPA MCL	Potential Health Effects
Gross Alpha particle activity (excluding radon and uranium)	none	15 pCi/L	15 pCi/L[2]	
Gross Beta particle activity	none	50 pCi/L 4 millirem/yr	4 millirem/yr[3]	
Radium-226	Ra-226	5 pCi/L	5 pCi/L [4]	
Radium-228	Ra-228	5 pCi/L	combined with Radium-226	Toxic kidney effects, risk of cancer.
Strontium-90	Sr	8 pCi/L	covered under gross beta	
Tritium	3H	20,000 pCi/L	covered under gross beta	
Uranium	U	20 pCi/L	30 µg/L[5] (~20 pCi/L)	

[1] MCL = Maximum Contaminant Level.

[2] pCi/L = picocurie per liter. One pCi is one trillionth of a Curie, 0.037 disintegrations per second, or 2.22 disintegrations per minute.

[3] Gross beta MCL is 4 millirems/year annual dose equivalent to the total body or any internal organ; Sr-90 MCL = 4 millirem/year to bone marrow; tritium MCL = 4 millirem/year to total body.

[4] EPA MCLs combine radium-226 and radium-228.

[5] µg/L = micrograms per liter, can be converted to pCi/L by multiplying by 0.67

Table Error! No text of specified style in document.**-3:** Secondary Maximum Contaminant Levels

Secondary Contaminants	**Chemical Formula**	**EPA MCL[1] (mg/L)[2]**	**CCR, Title 22 MCL (mg/L)**	**Noticeable Effects**
Aluminum	Al	0.5 to 0.2	0.2	Colored water.
Chloride	Cl^-	250	250	Salty taste.
Color[3]	--	15[3]	15	Visible tint.
Copper	Cu	1.0	15	Metallic taste; blue-green staining.
Corrosivity	--		not established	Metallic taste; corroded pipes/ fixtures staining.
Fluoride	F^-	2.0	not established	Tooth discoloration
Foaming Agents	--	0.5	0.5	Frothy, cloudy; bitter taste; odor.
Iron	Fe	0.3	0.3	Rusty color; sediment; metallic taste; reddish or orange staining.
Manganese	Mn	0.05	0.05	Black to brown color; black staining; bitter metallic taste.
Odor[4]	--	3 TON[4]	3 TON	"Rotten-egg" smell, musty or chemical smell.
pH	--	6.5-8.5	not established	Low pH: bitter metallic taste; corrosion. High pH: slippery feel; soda taste; salt deposits.
Silver	Ag	0.1	0.1	Skin discoloration; graying of the white part of the eye.
Specific Conductance[5]	--	not established	900[5]	Unpleasant taste or odor; gastrointestinal distress.
Sulfate	SO_4^{2-}	250	250	"Rotten-egg" smell, iron and steel corrosion or "black water"; can discolor silver, copper and brass utensils.
Total Dissolved Solids (TDS)	--	500	200	Hardness; deposits; colored water; staining; salty taste.
Zinc	Zn	5.0	5.0	Metallic taste.

[1] MCL = Maximum Contaminant Level.
[2] mg/L = milligrams per liter.
[3] Units are in color numbers.
[4] Units are in TON = Threshold Odor Number
[5] Units are in Siemens per centimeter = S/cm.

4.4 Current Sampling Results by Basin

General interpretations of the groundwater quality data for each groundwater basin sampled this year are in this section. The Annual Report includes a summary table of water quality analyses for nitrate, TDS, sulfate, chloride, and boron for each basin. These mineral constituents have specific numerical objectives that vary between basins and in some cases for areas within a basin. Presentation of the data in this format allows for comparison with the numerical mineral quality objectives outlined in the Basin Plan.

Table 4-4: Example of summary table.

Criteria	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
Primary MCL	45	none	none	none	none
Secondary MCL	none	500	250	250	none

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL.

The Piper Diagram in **Figure E-1** shows water quality for all wells sampled in the County. There is moderate variation in water quality with calcium as the dominant cation and sulfate as the dominant anion. The most common water type is calcium-sulfate.

4.4.1 Arroyo Santa Rosa Basin (DWR Basin No. 4-007)

The water-bearing units of the Arroyo Santa Rosa Basin occupy almost the entire area beneath the Santa Rosa Valley. The area west of the Bailey Fault is generally considered hydrogeologically separate from the area east of the fault, although some leakage across the fault does occur (Camrosa, 2013). The location of the fault is inferred primarily from water well data (Camrosa, 2013). Depth to water-bearing material is approximately 50 feet below ground surface (bgs). The water-bearing units west of the fault are confined and those located east of the fault are unconfined. The degree of groundwater movement across the fault is not clearly understood. The main water-bearing units in the basin consist of alluvium and parts of the San Pedro Formation, which can reach a thickness of up to 700 feet in the eastern portion of the basin. The major hydrologic features are the Conejo Creek and its tributary, Arroyo Santa Rosa, which drain surface waters westward toward the Pacific Ocean.

The basin is dominated by an east-trending syncline that folds the San Pedro and Santa Barbara Formations, directing water into the more permeable San Pedro Formation. The Santa Rosa fault zone places the less permeable Sespe and Topanga Formations against the San Pedro Formation, creating a barrier to groundwater flow into the basin from the north and is likely responsible for the difference in water levels in the western part of the basin (CSWRB, 1956).

Land use in the area overlying the basin consists principally of agriculture and rural residential development on large lots. Most of the area overlying the basin is unsewered with a high number of individual septic systems. Sources of nitrate to groundwater include septic systems, agricultural fertilization, and animal keeping. A large portion of recharge to the basin is discharge from the Thousand Oaks Hill Canyon Wastewater Treatment Plant.

There are 77 water supply wells in the Arroyo Santa Rosa Basin of which 38 are active. The Piper diagram in **Figure E-2** shows low variation in water quality of wells sampled in 2018. There is no dominant cation, but the samples plot closest to the magnesium cation type. Bicarbonate is the dominant anion for one of the samples and there is no dominant anion for the remainder. The water samples are magnesium-bicarbonate type.

Selected water quality results are presented in **Table 4-5**. Water from four of the five wells sampled have nitrate concentrations higher than the primary MCL. All five wells have TDS concentrations above the SMCL, ranging from 710 to 990 mg/L. Chloride concentrations in four wells are above the level that can impair agricultural beneficial uses for sensitive plants. However, they are not above the primary MCL. One sample was analyzed for Title 22 metals. None were above the primary MCL. The Piper diagram in **Figure E-3** shows a comparison of groundwater chemistry between Tierra Rejada Basin and the Arroyo Santa Rosa Basin. The water chemistry is similar but with more variation in the Tierra Rejada samples. **Figure 4-7** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate.

Table 4-5: Selected water quality results for the Arroyo Santa Rosa Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
19P02	12/17/18	**62**	**710**	109	105	0.2
20L01	11/28/18	**76**	**960**	169	119	0.2
23G03	12/20/18	**77**	**740**	92.1	147	0.1
23R01	12/20/18	**100**	**990**	194	182	0.3
25C06	12/17/18	**20.5**	**740**	164	150	0.3

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

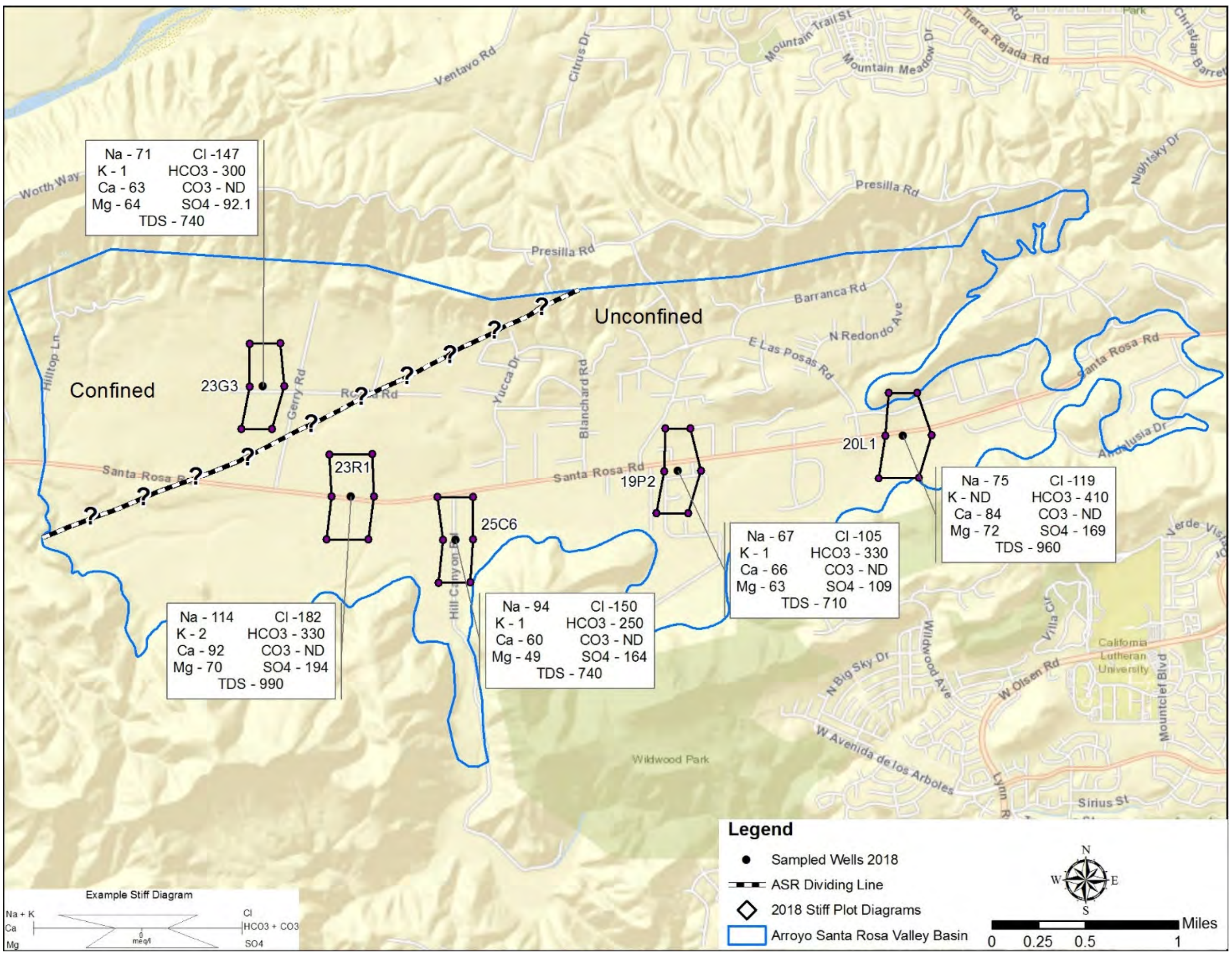


Figure 4-7: Arroyo Santa Rosa Basin wells sampled with Stiff diagrams and selected inorganic constituents.

Figure 4-8 shows the geographic distribution of wells sampled in 2018, with graduated symbols representing nitrate concentrations in 2017. **Figure 4-9** shows nitrate results for 2009 through 2018 in the same manner. The Arroyo Santa Rosa Basin has been nitrate-impacted for many years. Current sampling results exceed the state MCL of 45 mg/L in four of five wells. Management practices in the Ventura County Non-Coastal Zoning Ordinance were established to mitigate nitrate impacts. These include limiting the number of large animals kept and restricting septic systems. Camrosa blends well water pumped from the basin with imported water to reduce nitrate concentrations below the MCL. No groundwater samples collected this year had a nitrate (NO_3^-) concentration above 100 mg/L, less than historic concentrations as high as 292 mg/L.

ARROYO SANTA ROSA BASIN
2018 Nitrate Concentrations

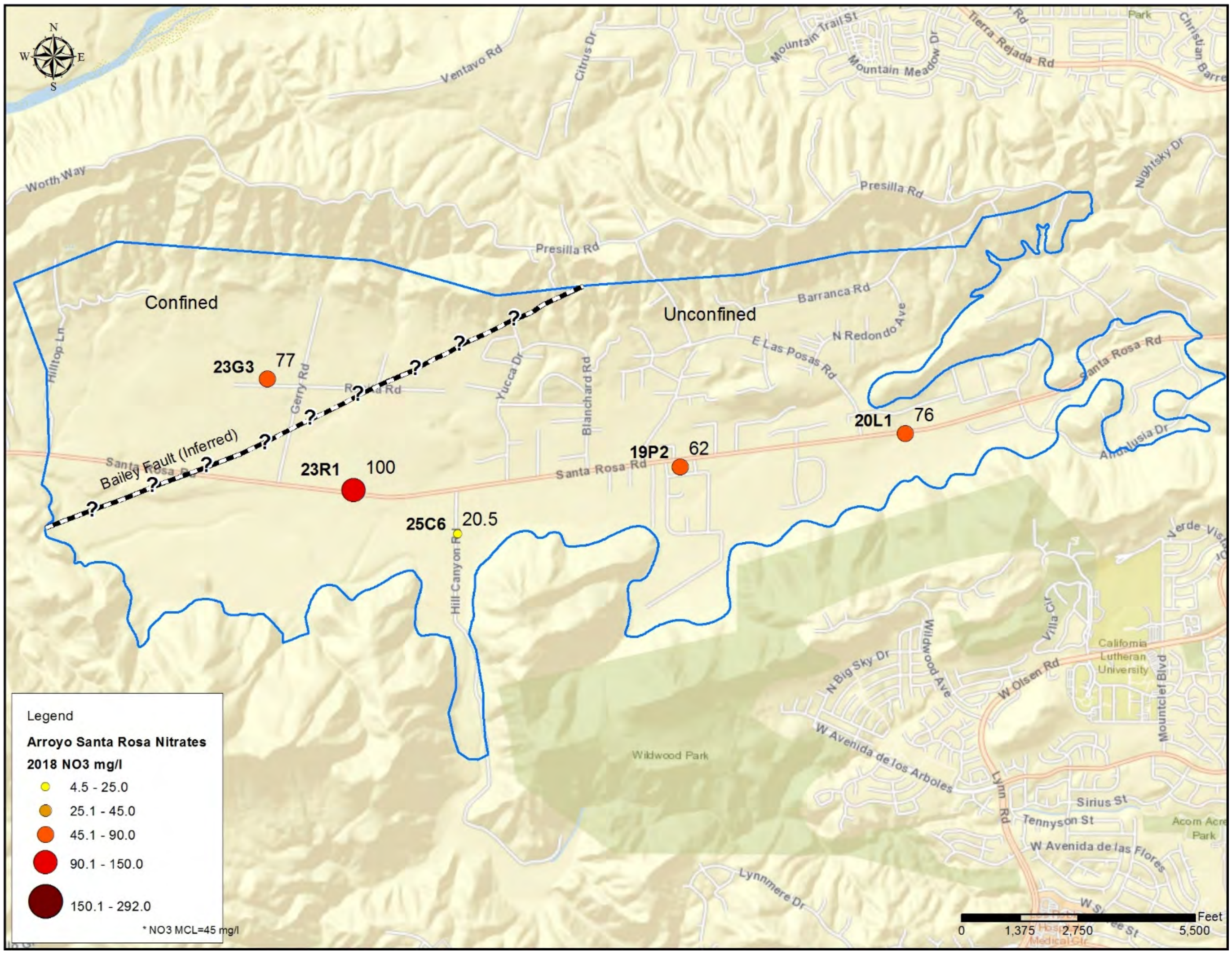


Figure 4-8: Arroyo Santa Rosa Basin nitrate concentrations for 2018.

ARROYO SANTA ROSA BASIN
2009 – 2018 Nitrate Concentrations

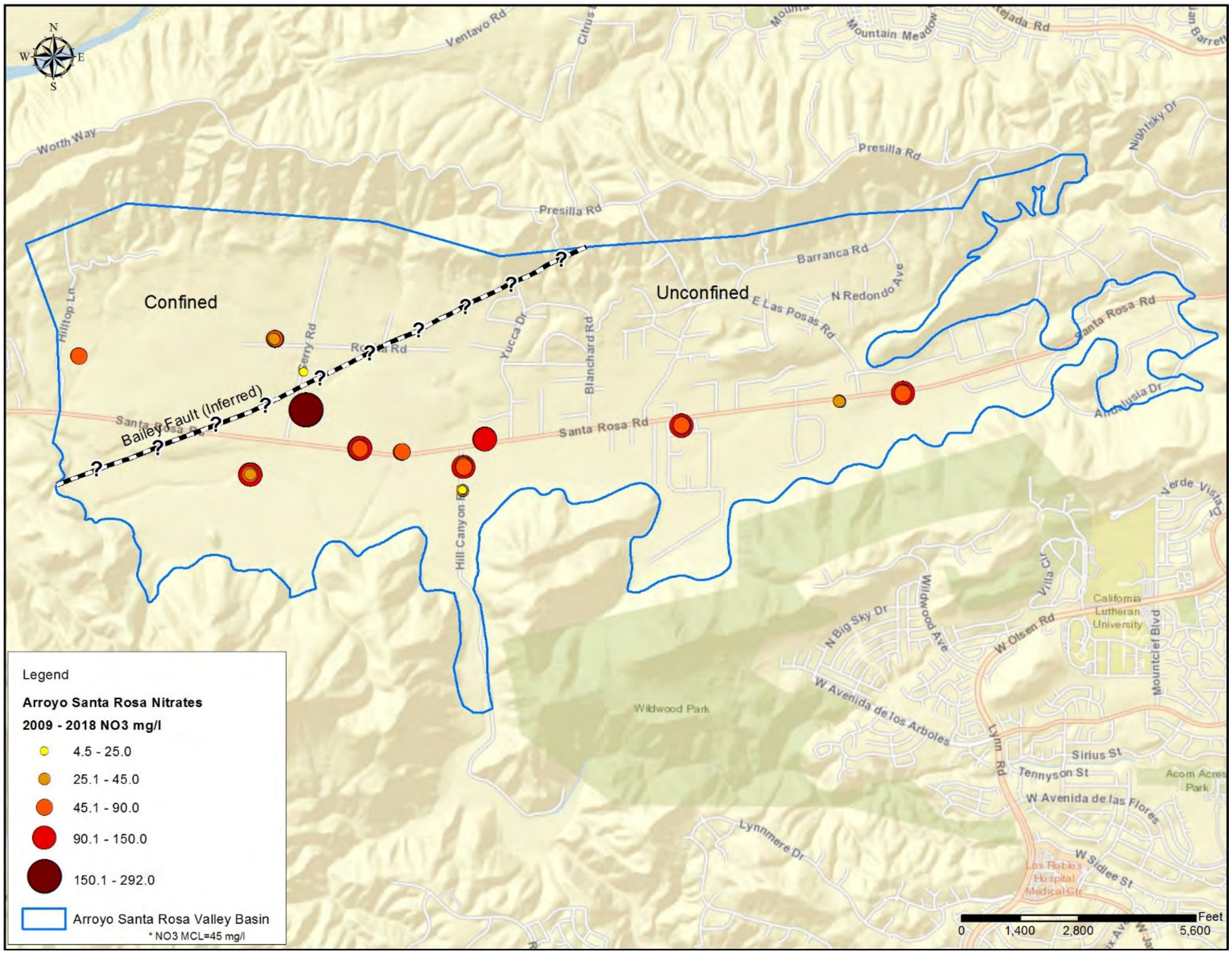


Figure 4-9: Arroyo Santa Rosa nitrate concentrations for 2009 – 2018.

4.4.2 Carpinteria Basin (DWR Basin No. 3-018)

Previous Annual Reports used the North Coast Basin boundary (a County of Ventura-defined area) for wells in the very western extent of the County. DWR Bulletin 118 designates this part of the County as the Carpinteria Basin as is designated in this Annual Report. The Ventura County portion of the Basin consists of narrow, thin strips of permeable sediments and marine terrace deposits along the coastline from Rincon Creek to just northwest of the Ventura River. There are 18 water supply wells in the Ventura County portion of the basin, of which 5 are active and primarily located in the northwestern area along Rincon Creek. Water samples were collected from two wells at the northwestern end of the Ventura County portion of the basin. The Piper diagram in **Figure E-4** shows little variation in the water quality of wells sampled in 2018. Calcium is the dominant cation in one sample with no dominant cation in the other. Bicarbonate is the dominant anion in one sample with no dominant anion in the other sample. The other sample plots closely to sulfate. The water in one sample is calcium-sulfate type and the other is calcium-bicarbonate.

Both samples have TDS and one has sulfate concentrations above the SMCL (**Table 4-6**). **Figure 4-10** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 4-6: Selected water quality results for the Carpinteria Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
25N06	11/19/2018	9.3	**1,140**	**315**	107	0.3
35G01	11/19/2018	10.6	**530**	118	33	0.1

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

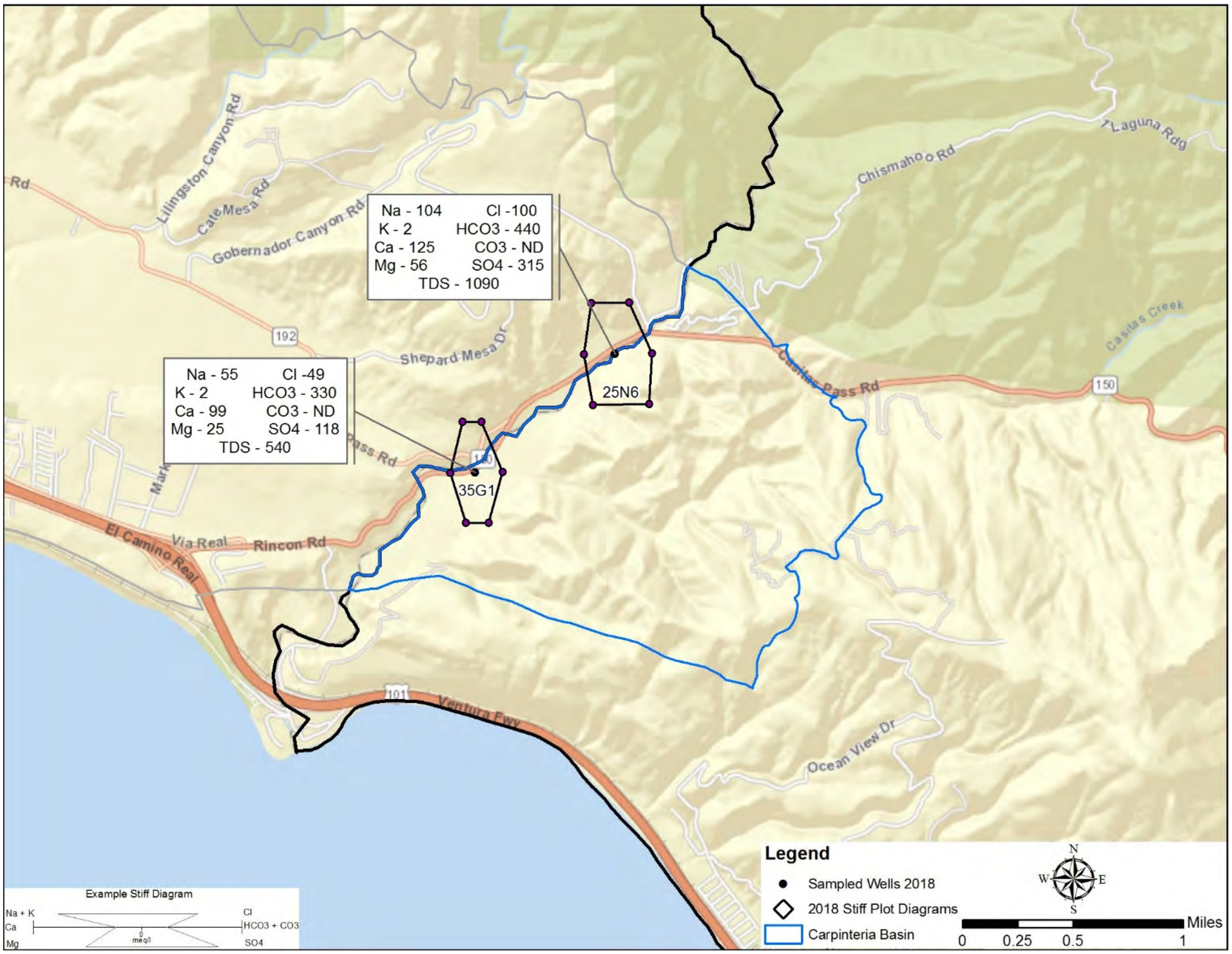


Figure 4-0: Carpinteria Basin sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.3 Conejo Basin (DWR Basin No. 4-010)

The Conejo Basin has few active water wells available for sampling. The depth to groundwater averages about 50 feet bgs. The water-bearing units in the basin are Quaternary alluvium and the Modelo, Topanga and Conejo Formations. The quaternary alluvium is generally only a few feet thick except near Newbury Park and Thousand Oaks where it can reach up to 60 feet in thickness. The alluvium is not the main water-bearing unit in the basin. The Miocene age Topanga and Conejo Formations are coeval and intercalated (the same age and interbedded). Within the Conejo Basin area, the Topanga formation contains sandstone, conglomerate, and shale. The Conejo Formation consists of volcanic tuff, debris flow, and basaltic flow and breccia deposits 13,000 feet thick. The high porosity of the fractured basaltic flows allows production from these units. There are approximately 429 wells in the Conejo Basin of which 60 are active water. No wells were sampled in this basin in 2018. **Figure 4-11** shows the extent of the Conejo Basin.

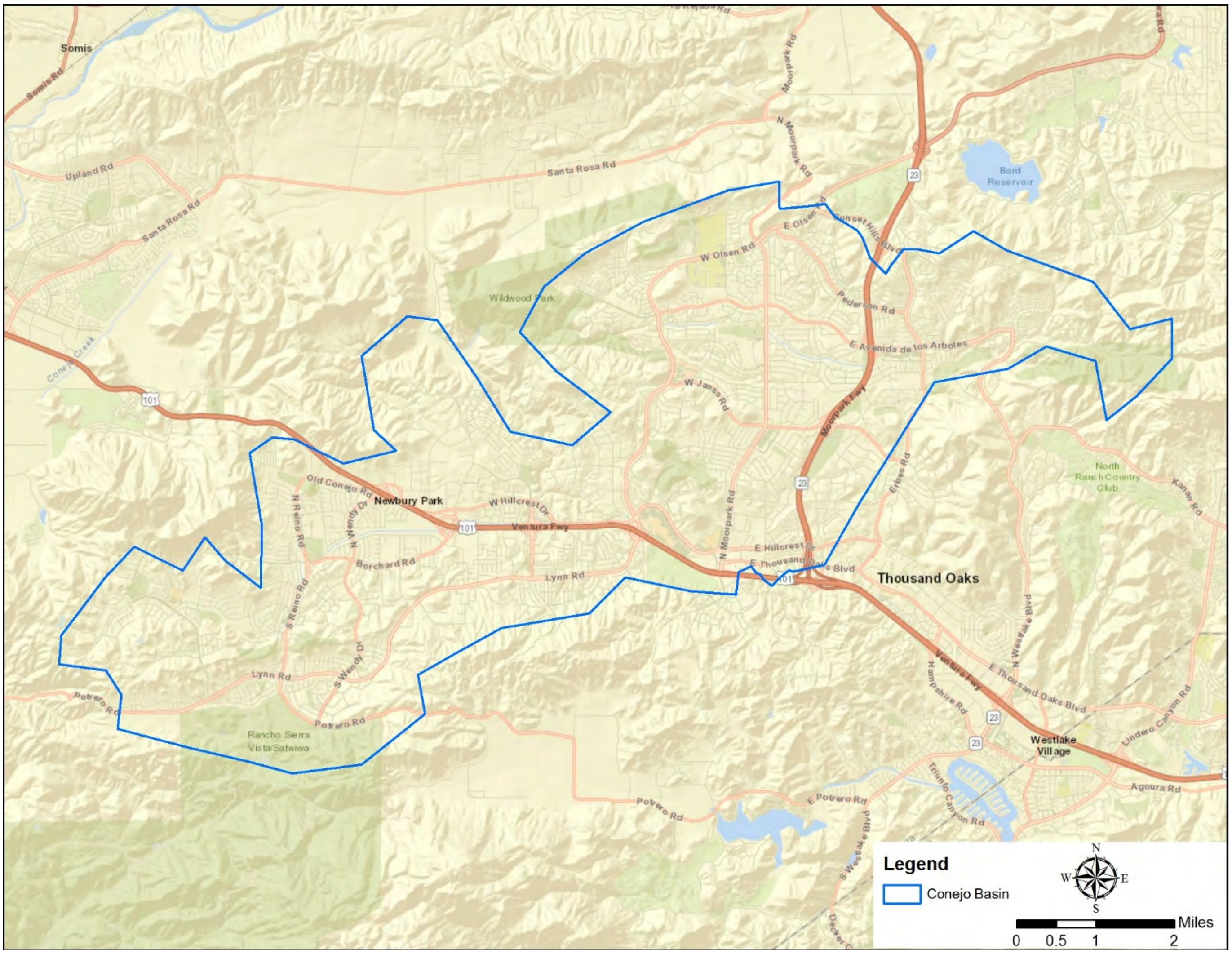


Figure 4-11: Conejo Basin.

4.4.4 Cuddy Ranch Area Basin (DWR Basin No. 5-083)

The Cuddy Ranch Area Basin is in the northeastern part of Ventura County near the Kern County boundary. Two faults contribute to the formation of the basin. The east-west trending San Andreas fault zone and Tecuya Mountain fault bound the north portion. The southwest trending Big Pine Fault and associated splays bound and underlie the southern portion of the basin. The portion of the Basin adjacent to the Big Pine Fault zone is locally known as Little Cuddy Valley. Groundwater sampling has been limited to the Little Cuddy Valley portion of the basin. Water-bearing units consist of recent alluvial sand and gravel overlying shallow bedrock, permeable sands, and gravels in the Quaternary and Tertiary sandstones, and highly fractured igneous or metamorphic rocks. Depth to water-bearing material is approximately 20 to 30 feet bgs.

Historically, groundwater quality has been considered very good. There are approximately 25 water supply wells in the Little Cuddy Valley Basin of which 21 are active. No wells were sampled in this basin in 2018. **Figure 4-12** shows the extent of the Cuddy Ranch Area Basin.

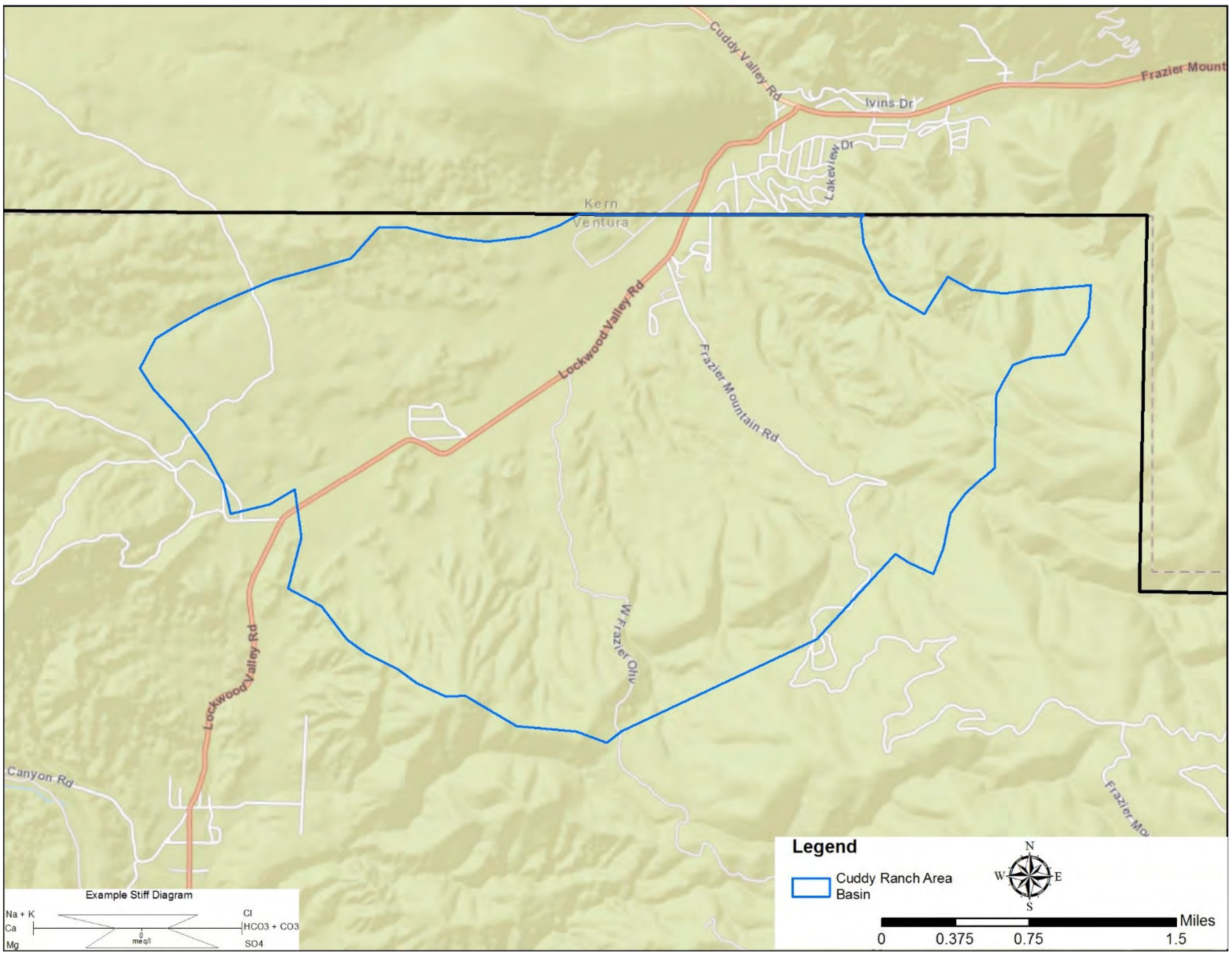


Figure 4-12: Cuddy Ranch Area Basin.

4.4.5 Cuyama Valley Basin (DWR Basin No. 3-013)

The Cuyama Valley Basin is in a remote area in northwestern Ventura County. The map in **Figure 4-13** shows only the portion of the basin that is in Ventura County. There are approximately 134 water supply wells in the Basin, of which 100 are active. Depth to the main water-bearing unit varies between 40 to 170 feet bgs. No wells were sampled in this basin in 2018. **Figure 4-13** shows the extent of the Cuyama Valley Basin.

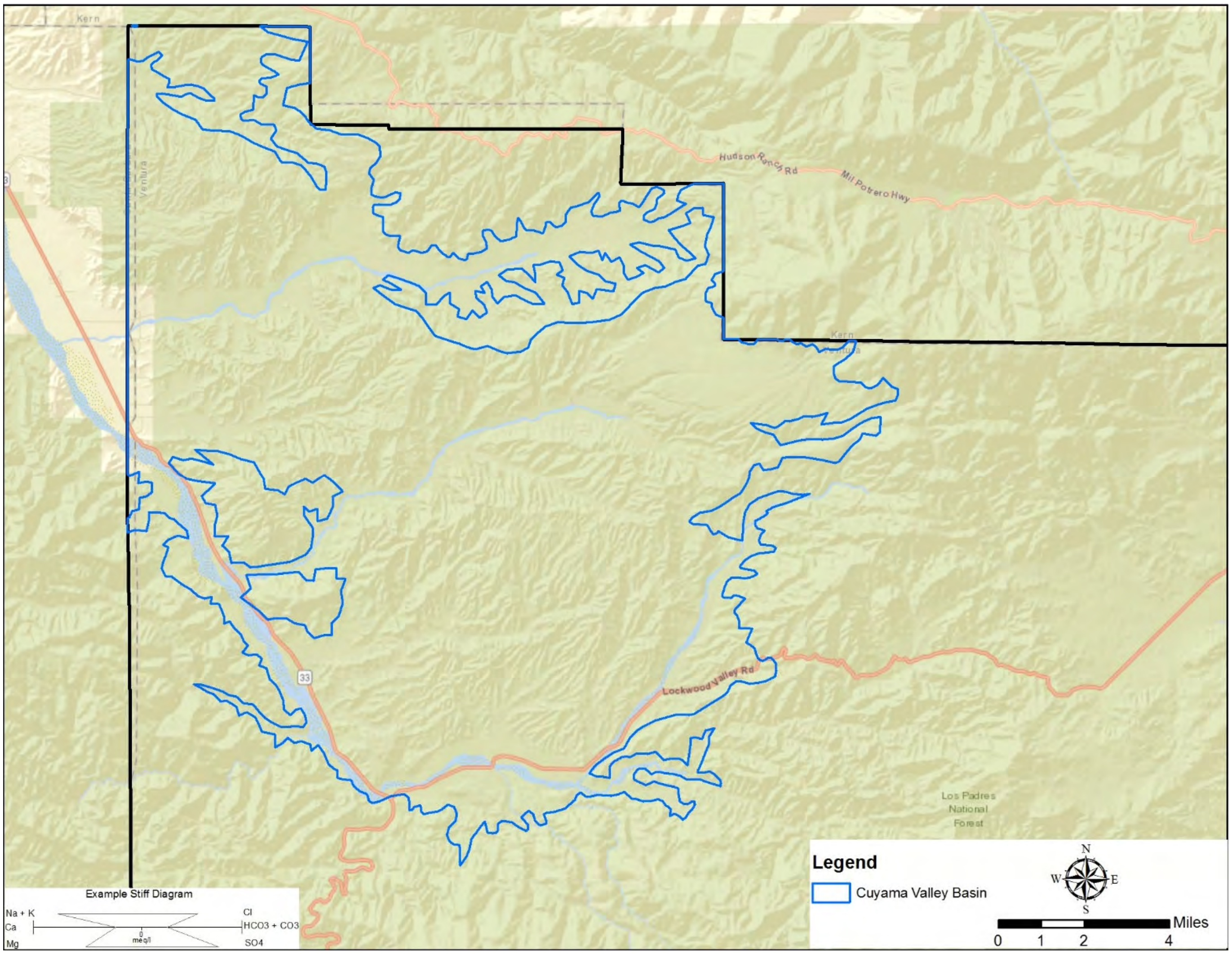


Figure 4-13: Cuyama Valley Basin.

4.4.6 Santa Clara River Valley Basin - Fillmore Subbasin (DWR Basin No. 4-004.05)

The Fillmore Subbasin, though small in geographic area, has a total aquifer thickness of almost 8,000 feet in various locations. Despite the depth of the subbasin, County records indicate that water wells are generally no deeper than 950 feet. Water quality can vary greatly depending on the depth of a well. Shallow groundwater is generally younger and recharged by river flows. Deeper groundwater is older and has acquired its aqueous chemistry through dissolution of constituents from the surrounding lithology. There are approximately 596 water supply wells in the Fillmore Subbasin, of which 444 are active. Historically, nitrate concentrations have been elevated, but none of the nine wells sampled this year showed elevated nitrate concentration relative to the primary MCL (**Table 4-7**). The Piper diagram in **Figure E-5** shows moderate variability in water quality of wells sampled in 2018. The dominant cation in two samples is calcium with no dominant cation for the remainder of the samples. The analytical data plots closest to a calcium cation type. Sulfate is the dominant anion for all nine samples. The water is calcium-sulfate type. TDS concentrations of water from the nine wells range from 980 to 2,410 mg/L and exceed the SMCL. All samples exceed the sulfate SMCL and water from two wells exceeds the manganese SMCL. Water samples from two wells were analyzed for Title 22 metals. All Title 22 metals concentrations were below the MCL except selenium, which was above the primary MCL in one sample. Water quality tends to degrade in the southeastern portion of the Subbasin in the vicinity of the Oak Ridge fault. **Figure 4-14** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate. Water samples from all wells sampled in the Fillmore, Santa Paula and Piru subbasins were compared in a Piper diagram in **Figure E-14**. The Piper diagram shows moderate variability and the data from the three subbasins show little variation. The water in the Fillmore Subbasin is calcium-sulfate type.

Table 4-7: Selected water quality results for the Fillmore Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
06D02	11/14/18	16.1	**1,000**	**414**	66	0.6
01F05	08/22/18	15.8	**1,040**	**451**	63	0.6
02R05	11/14/18	33.7	**2,410**	**1,030**	218	1.4
09D01	11/14/18	40.7	**1,380**	**565**	81	0.9
01P08	09/11/18	22.8	**1,080**	**484**	50	0.6
31F01	08/22/18	10.8	**1,010**	**434**	73	0.7
32R03	08/22/18	38.2	**980**	**415**	55	0.4
36D07	08/22/18	12.5	**1,130**	**497**	70	0.7
36P04	08/22/18	19.5	**1,040**	**443**	57	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

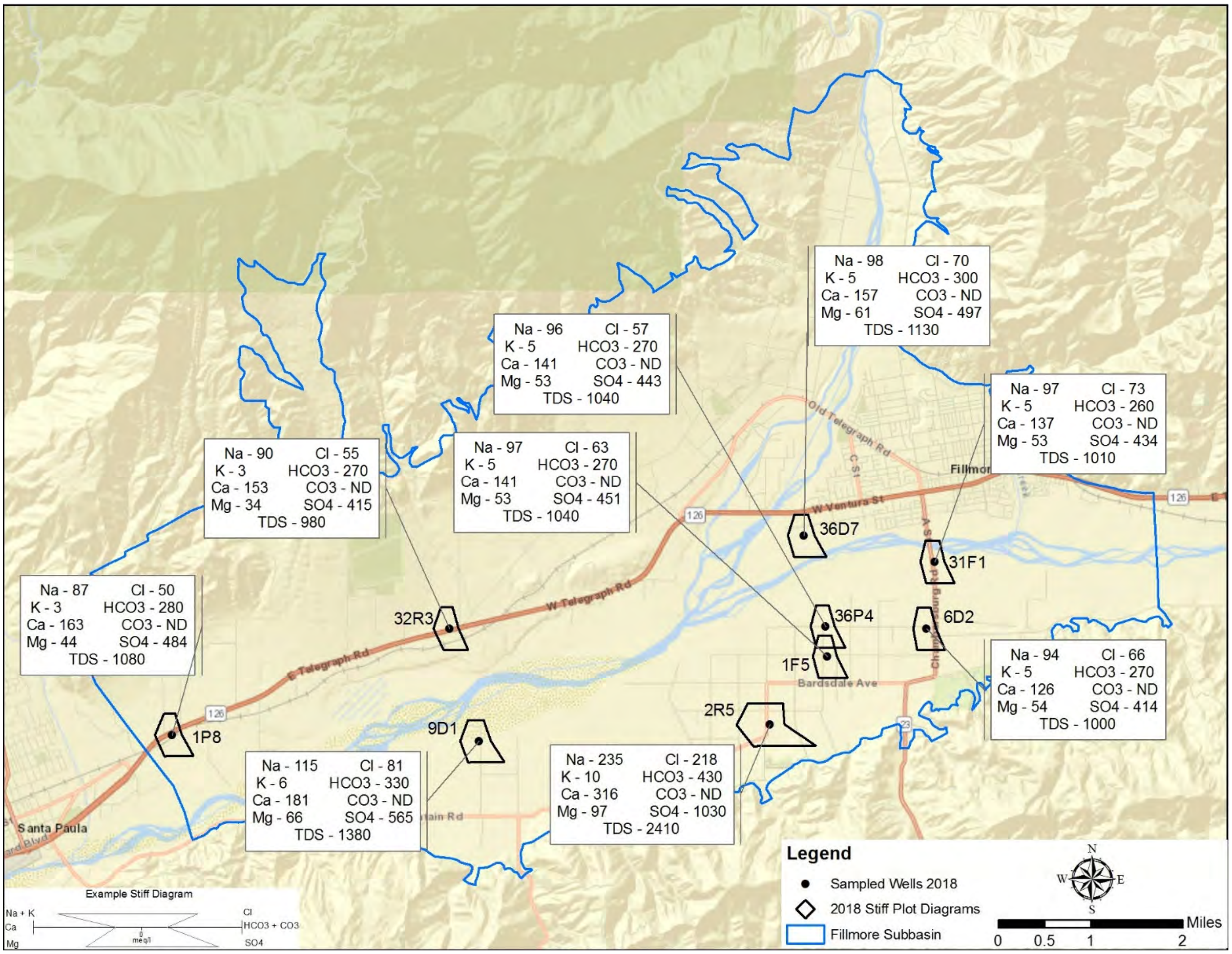


Figure 4-14: Fillmore Subbasin wells sampled with Stiff diagrams and selected inorganic constituents.

4.4.7 Las Posas Valley Basin (DWR Basin No. 4-008)

Previous Annual Reports divided the Las Posas Valley area into three basins (east, west and south) using boundaries delineated by the County of Ventura. DWR Bulletin 118 basin boundaries designate one basin boundary for the whole valley. The geology of the basin causes differences in water levels and water quality between the east and the west areas. Two management areas have been defined in the FCGMA groundwater sustainability plan (GSP). The West Management Area (WMA) encompasses what was formerly the West Las Posas Basin area and the East Management Area (EMA) encompasses the area that was formerly the East Las Posas Basin and the South Las Posas Basin.

4.4.7.1 Las Posas Valley Basin – East Management Area

Water-bearing units of the EMA consist of Quaternary and Pleistocene alluvial deposits of varying thickness. Water-bearing deposits consist primarily of sand, or a mixture of sand and gravel identified as the Fox Canyon Aquifer and is the basal member of the San Pedro Formation (Stokes, 1971). The Fox Canyon Aquifer is generally considered to be confined in the EMA. The Fox Canyon Aquifer receives recharge from leakage from overlying aquifers (FCGMA 2007 Basin Management Plan) and the exact hydrogeologic continuity is not well understood. The Somis fault acts as a hydrogeologic boundary between the East and West Subbasins. Depth to the upper water-bearing unit is approximately 120 to 150 feet bgs and 530 to 580 feet bgs to the lower water-bearing unit. There are approximately 457 water supply wells in the EMA, of which 167 are active.

The Piper diagram in **Figure E-6** shows moderate variability in water quality between ten wells sampled in 2018. Calcium is the dominant cation in five samples and with no dominant cations in the other samples. Sulfate is the dominant anion in three samples, bicarbonate is the dominant anion in three samples with the four remaining samples have no dominant anion. The water in three wells is calcium-bicarbonate type and the water in the remaining wells is calcium-sulfate type. Of the ten wells sampled in the EMA, two wells located in the southwestern area near the Arroyo Las Posas have different water chemistry. TDS and sulfate are above the SMCL in the southwestern-most wells. Chloride levels for the two southwestern wells do not exceed the primary MCL but are above the level that could cause impairment of agricultural beneficial uses for sensitive plants. The remainder have good water quality with TDS ranging between 310 and 1,580 mg/L (**Table 4-8**).

The Piper diagram in **Figure E-21** shows a comparison between the EMA and WMA water chemistry. There is moderate variability in the water quality of the combined areas. Water samples from both management areas are grouped by those with sulfate as the dominant anion and as calcium-sulfate type, and those with no dominant anion but plot near the bicarbonate type and calcium-bicarbonate type. The water chemistry of both management areas is similar, although based on in water level differences between the EMA and WMA, the degree of hydrogeologic connection appears to be limited. **Figure 4-15** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate of the EMA.

Table 4-8: Selected water quality results for the Las Posas Valley Basin – East Management Area.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
01Q01	11/27/18	31.6	**1,210**	**396**	135	0.8
04B01	12/18/18	ND	**510**	189	14	ND
04F01	12/18/18	ND	**900**	**389**	91	0.1
09Q07	11/26/18	24.2	**1,580**	**614**	176	0.7
16B06	11/27/18	ND	**1,300**	**479**	160	0.7
29K06	11/21/18	**78.5**	400	30.8	45	ND
29K08	11/21/18	15.8	470	128	28	0.1
28J04	11/26/18	**50.3**	**550**	122	39	0.2
34L02	12/18/18	ND	440	157	12	ND
36P01	11/27/18	19.5	310	51.1	19	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

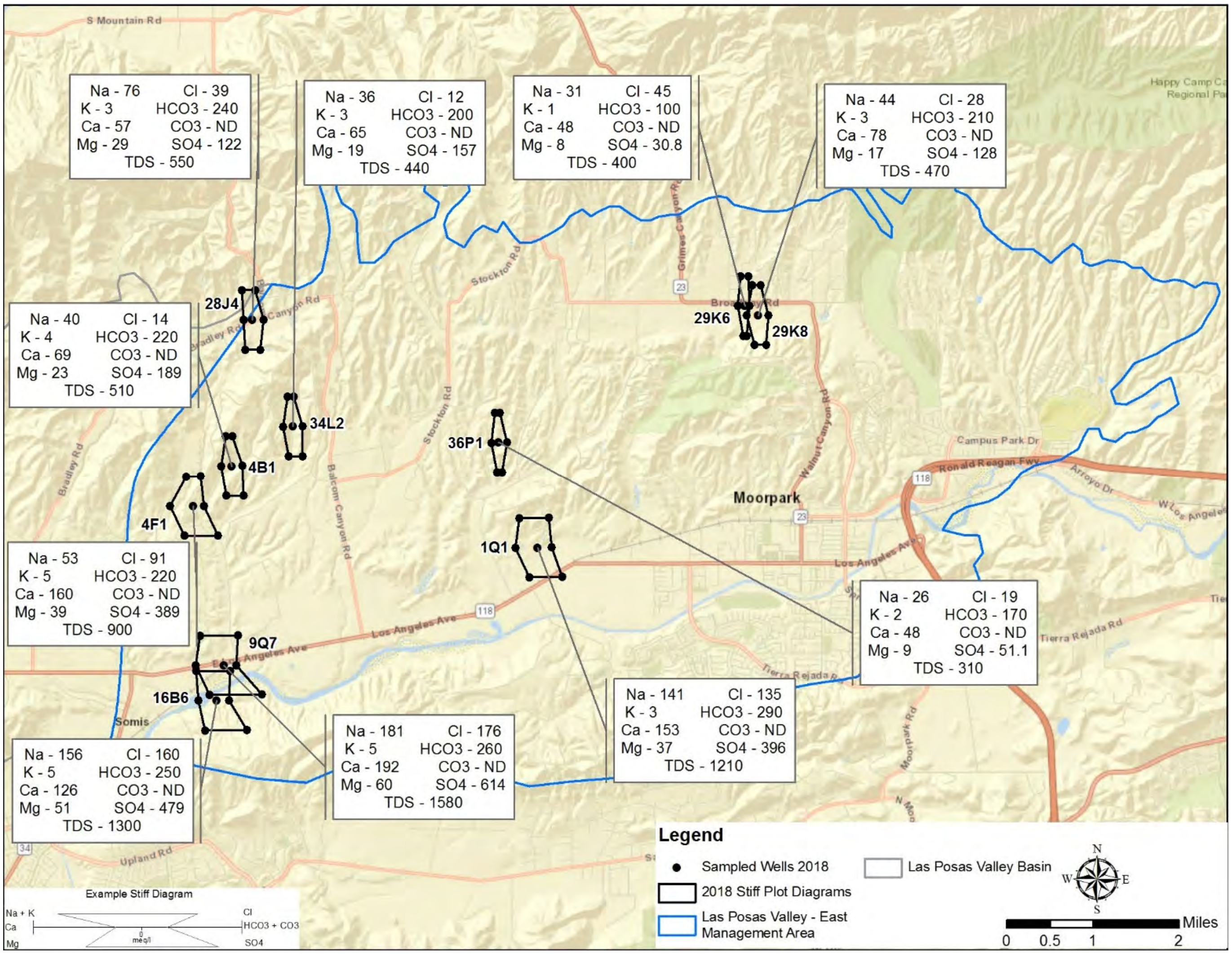


Figure 4-15: Las Posas Valley Basin EMA, sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.7.2 Las Posas Valley Basin – West Management Area

There are approximately 192 water supply wells in the WMA of the Las Posas Valley Basin, of which 91 are active. Eleven wells within the WMA were sampled in 2018. The Piper diagram in **Figure E-7** shows moderate variability in water quality. Calcium is the dominant cation in two samples, sodium is the dominant cation in one sample with no dominant cation in the remaining samples. Bicarbonate is the dominant anion in four samples, and sulfate is the dominant anion in six samples. There is no dominant anion in the remaining sample, but it plots closely to the sulfate anion type. The water in three wells is calcium-bicarbonate type, one is sodium-bicarbonate type, and the remainder are calcium-sulfate type.

TDS is above the SMCL in ten wells, ranging from 480 to 1,310 mg/L (**Table 4-9**). Water from one well has a nitrate concentration above the primary MCL. Six samples have sulfate concentrations above the SMCL, and six samples have manganese concentrations above the MCL. Water from four wells was analyzed for Title 22 metals and all constituents were below the MCLs. **Figure 4-16** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate.

Table 4-9: Selected water quality results for the Las Posas Basin - West Management Area.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
17L01S	11/27/18	21.2	**1,300**	**488**	150	0.6
08H03	11/21/18	16.4	**750**	220	66	0.3
09N01	12/20/18	2.8	**530**	131	52	0.3
10G03	11/16/18	10.5	**610**	152	51	0.3
11A02	11/16/18	**170**	**1,310**	**404**	120	0.2
11A03	11/16/18	0.6	**600**	180	34	0.2
13A01	11/27/18	ND	480	156	13	0.1
15M04	11/21/18	12.1	**990**	**370**	76	0.4
17F05	11/16/18	0.5	**1,060**	**418**	64	0.7
18H14	12/20/18	ND	**910**	**364**	47	0.4
32H03	11/21/18	ND	**930**	**374**	22	0.2

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

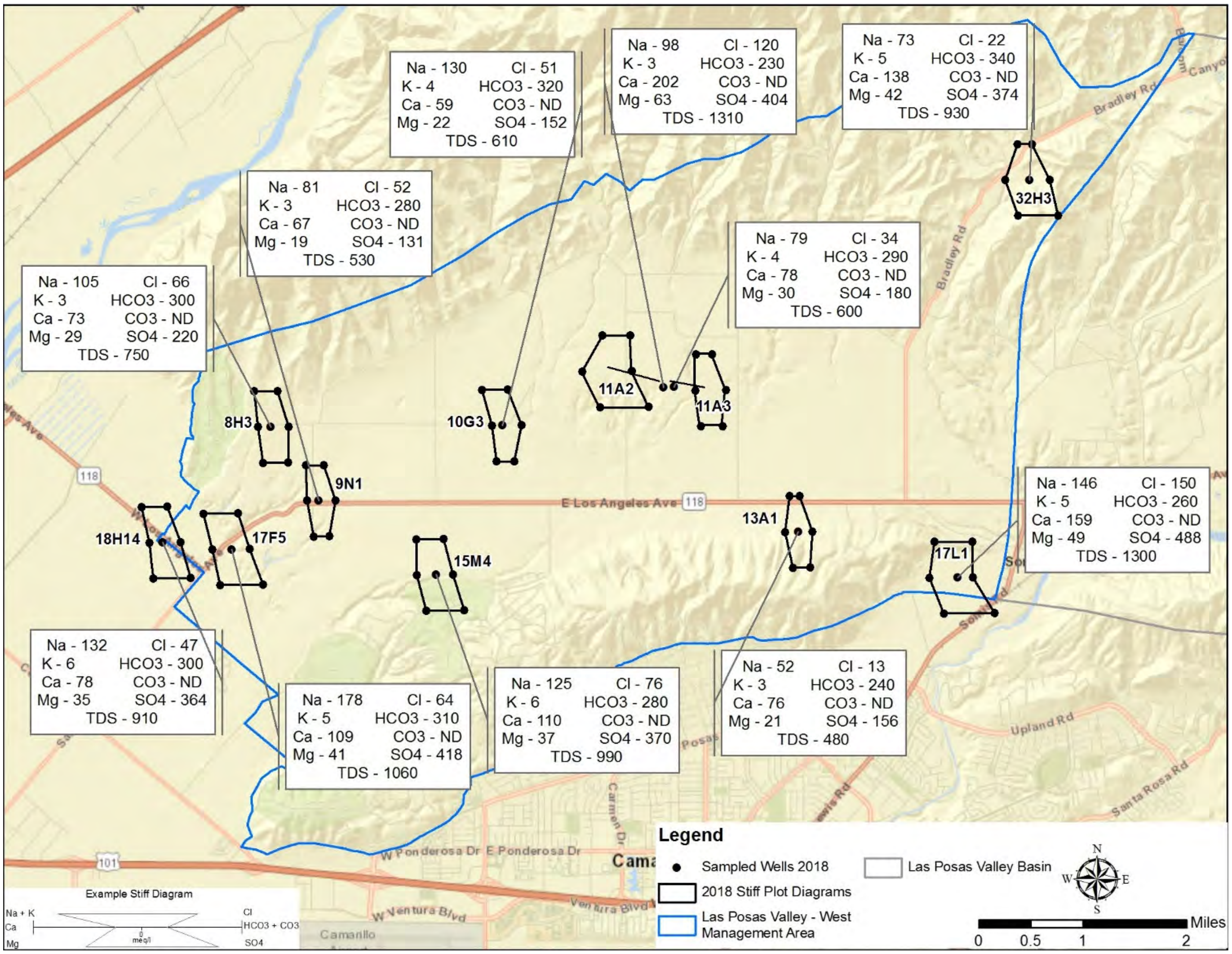
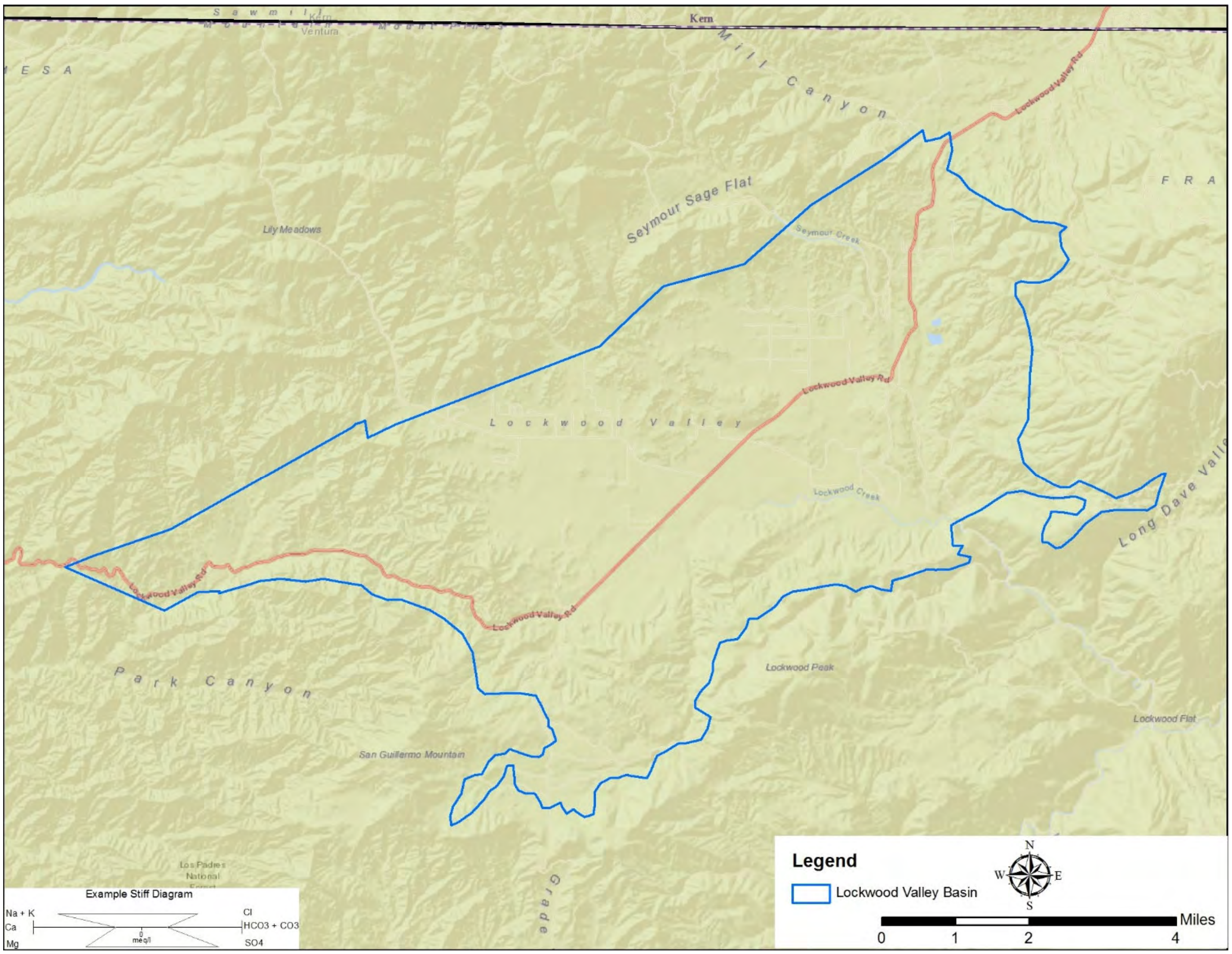


Figure 4-16: Las Posas Valley Basin WMA sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.8 Lockwood Valley Basin (DWR Basin No. 4-017)

The Lockwood Valley Basin groundwater quality ranges from good to poor. The Basin covers a geographic area of 34.1-square miles. Water-bearing units consist of Quaternary alluvium, Tertiary sedimentary rocks, and Quaternary stream channel alluvium. The Tertiary sedimentary rocks have high silt and clay content, resulting in low permeability. The alluvial material consists primarily of silty and clayey sands, gravels and boulders and has a much higher permeability than the underlying Tertiary sedimentary rocks. The Quaternary stream channel alluvium, prevalent near existing stream channels, contain a smaller percentage of clays and silts and wells penetrating this material tend to be higher yielding producers. Depth to water-bearing units range from 55 to 60 feet bgs. There are approximately 289 water supply wells in the Lockwood Valley Basin, of which 247 are active. No wells were sampled in the basin in 2018. **Figure 4-17** shows the extent of the Lockwood Valley Basin.



<u>Figure 4-17:</u> Lockwood Valley Basin.

4.4.9 Santa Clara River Valley Basin - Mound Subbasin (DWR Basin No. 4-004.03)

The water-bearing units of the Mound Subbasin consist of Quaternary alluvium and the San Pedro Formation. These formations are divided into the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS). The UAS consists of undifferentiated Holocene alluvium that make up the Oxnard Aquifer and older Pleistocene alluvium that makes up the Mugu Aquifer. The alluvium consists of silts and clays with lenses of sand and gravel, with a maximum thickness of 500 feet. The LAS predominantly consists of fine sands and gravels of the San Pedro Formation and extends as deep as 4,000 feet bgs. The upper part of the San Pedro formation consists of variable amounts of clay, silty clay, and sand. A series of inter-bedded water-bearing sands in this unit are time equivalent to the Hueneme Aquifer of the Oxnard Subbasin. The lower part of the San Pedro Formation consists primarily of sand and gravel zones with layers of clay and silt. and is equivalent to the Fox Canyon aquifer found in the Oxnard plain. Groundwater is generally unconfined in the alluvium and confined in the San Pedro Formation. Historic water quality data for the basin shows that water quality is generally better in the lower zone.

There are 90 water supply wells in the Mound Subbasin, of which 32 are active. No wells were sampled in this basin in 2018. **Figure 4-18** shows the extent of the Mound Subbasin.

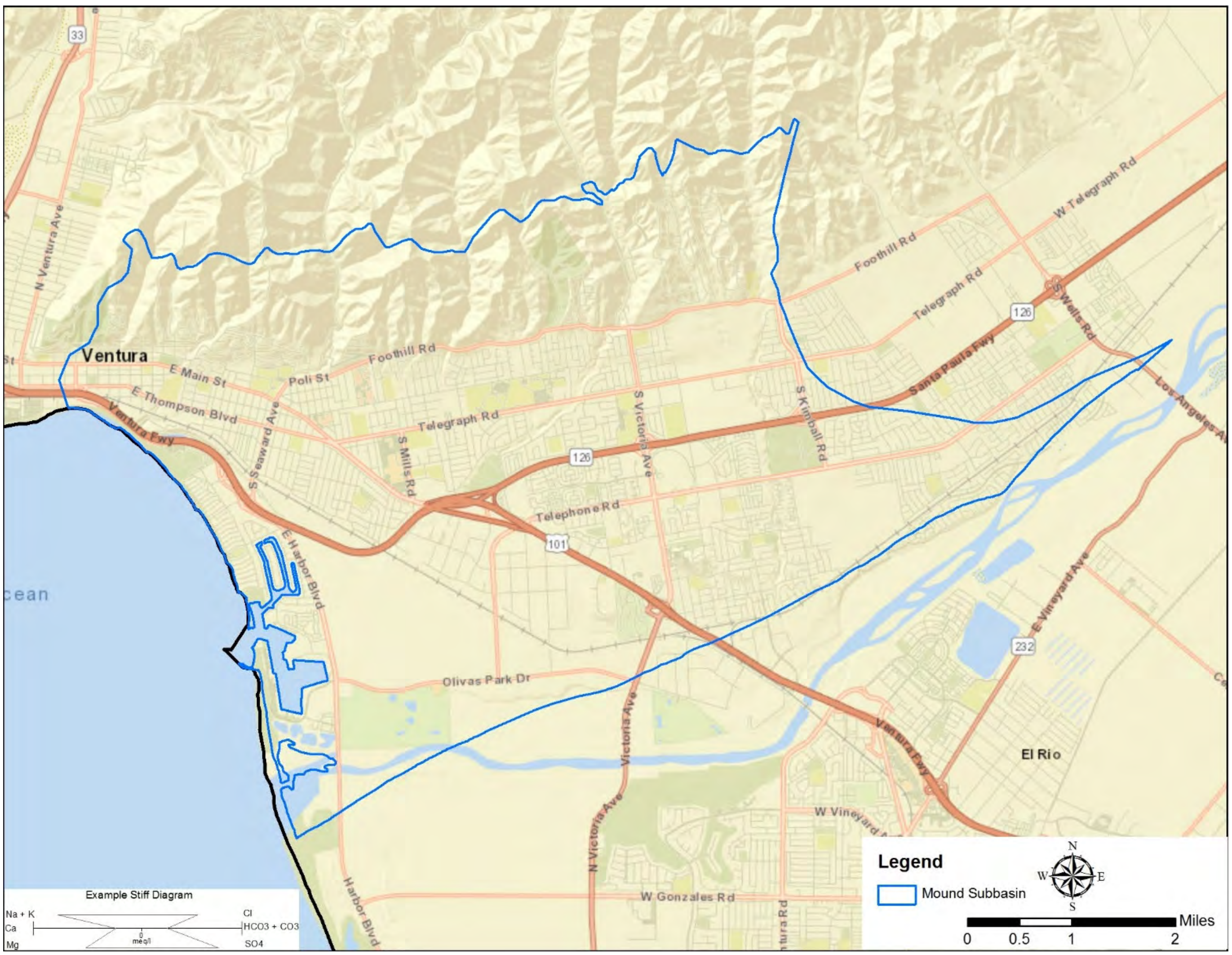


Figure 4-18: Mound Subbasin.

4.4.10 Ojai Valley Basin (DWR Basin No. 4-002)

The aquifer system of the Ojai Valley Basin is considered unconfined except in the western end of the basin where a semi-confining to confining clay layer is present. Water quality in the basin is considered good. There are approximately 330 water supply wells in the basin, of which 189 are active. Depth to water-bearing units is generally 25 to 30 feet bgs. The Piper diagram in **Figure E-8** shows low variation of the water quality for five wells sampled in 2018. Calcium is the dominant cation in all the samples. Sulfate is the dominant anion in one sample, bicarbonate in one sample, and no dominant anion in the remaining three samples. The water in one well is calcium-bicarbonate type and the remaining four are calcium-sulfate type.

Water from all five wells have TDS concentrations above the SMCL. TDS concentrations range from 630 to 820 mg/L. The Sulfate concentration in one well and the manganese concentration in one well exceed the SMCL. Water samples from two wells were analyzed for Title 22 metals. None of the constituents were above the primary MCL. **Figure 4-19** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate for wells sampled in the Ojai Valley Basin.

Table 4-10: Selected water quality results for the Ojai Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
04Q01	11/13/18	**45.9**	**640**	210	28	ND
05H04	11/20/18	17.9	**630**	208	19	ND
06K10	11/20/18	20.4	**640**	201	26	ND
01K02	11/13/18	2.4	**690**	191	48	ND
33J01	11/15/18	ND	**820**	**315**	31	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

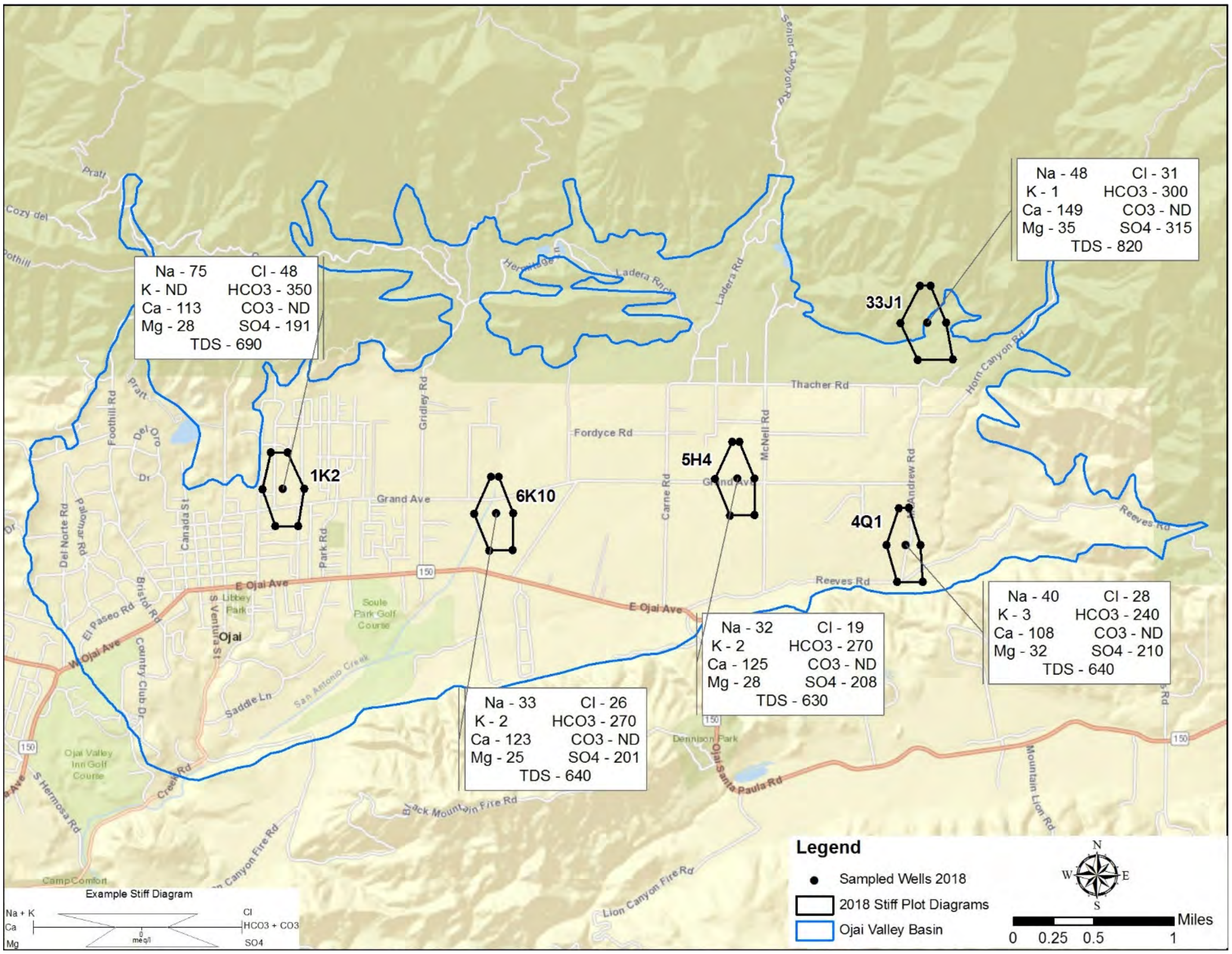


Figure 4-19: Ojai Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.11 Santa Clara River Valley Basin - Oxnard Subbasin (DWR Basin No. 4-004.02)

Previous Annual Reports divided the Oxnard Subbasin into two separate basins, the Oxnard Plain Forebay and the Oxnard Plain Pressure Basin. DWR Bulletin 118 groundwater basin boundaries are used in this Annual Report and the Forebay is included within the boundary of the Oxnard Subbasin. Because of the difference in UAS geology between the Oxnard Plain Forebay and the Oxnard Plain Pressure Basin, the Forebay is separated as a management area within the Oxnard Subbasin. The Oxnard Subbasin is the largest and most complex of the groundwater basins in Ventura County and consists of the UAS and the LAS. There are approximately 1,180 water supply wells in the Oxnard Subbasin, of which 469 are active.

From shallowest to deepest, the UAS consists of the Perched/Semi Perched, Oxnard and Mugu aquifers. Only the Oxnard and Mugu Aquifers are sampled in the UAS. The LAS, from shallowest to deepest, consists of the Hueneme, Fox Canyon and Grimes Canyon aquifers. There are no wells perforated solely in the Grimes Canyon aquifer, therefore it cannot be sampled exclusively.

Figure 4-21 shows approximate well locations and concentrations of TDS, sodium, potassium, calcium magnesium, chloride, bicarbonate, carbonate, and sulfate for wells sampled in the UAS. **Figure 4-22** shows the same information for wells sampled in the LAS.

4.4.11.1 Forebay Management Area

The Forebay Management Area is the principal recharge area for the UAS and LAS of the Oxnard Subbasin. Depth to water-bearing units is generally 25 to 50 feet bgs. There are approximately 283 water supply wells in the Forebay Management Area, of which 101 are active. The Forebay Management Area generally has acceptable water quality except in the southern area where high nitrate concentrations are common. The northern area is predominantly agricultural with a few residential areas that rely on individual septic systems. No wells were sampled in in 2018. **Figure 4-20** shows the extent of the Oxnard Forebay Management Area.

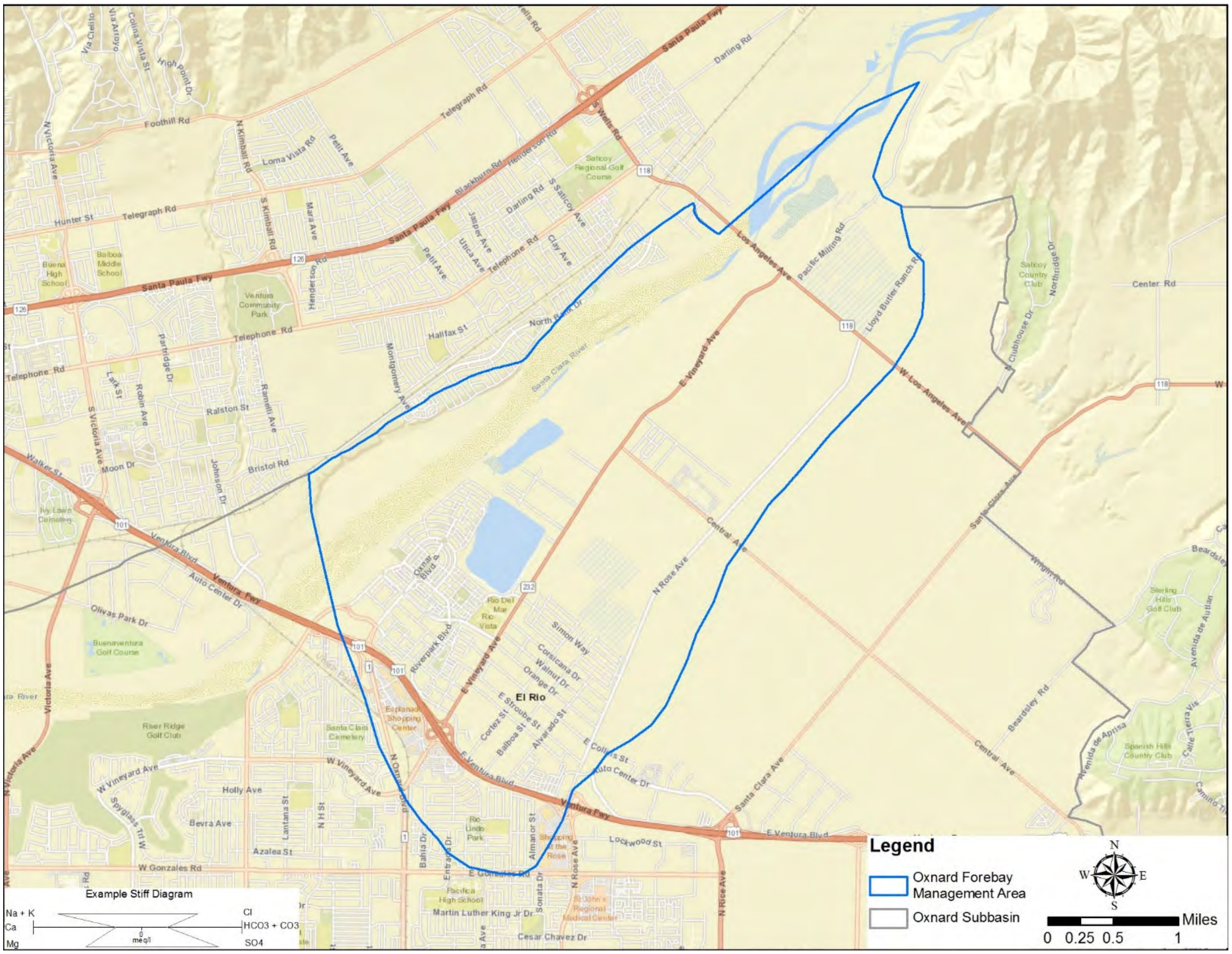


Figure 4-20: Oxnard Subbasin Forebay Management Area.

4.4.11.2 Upper Aquifer System (UAS)

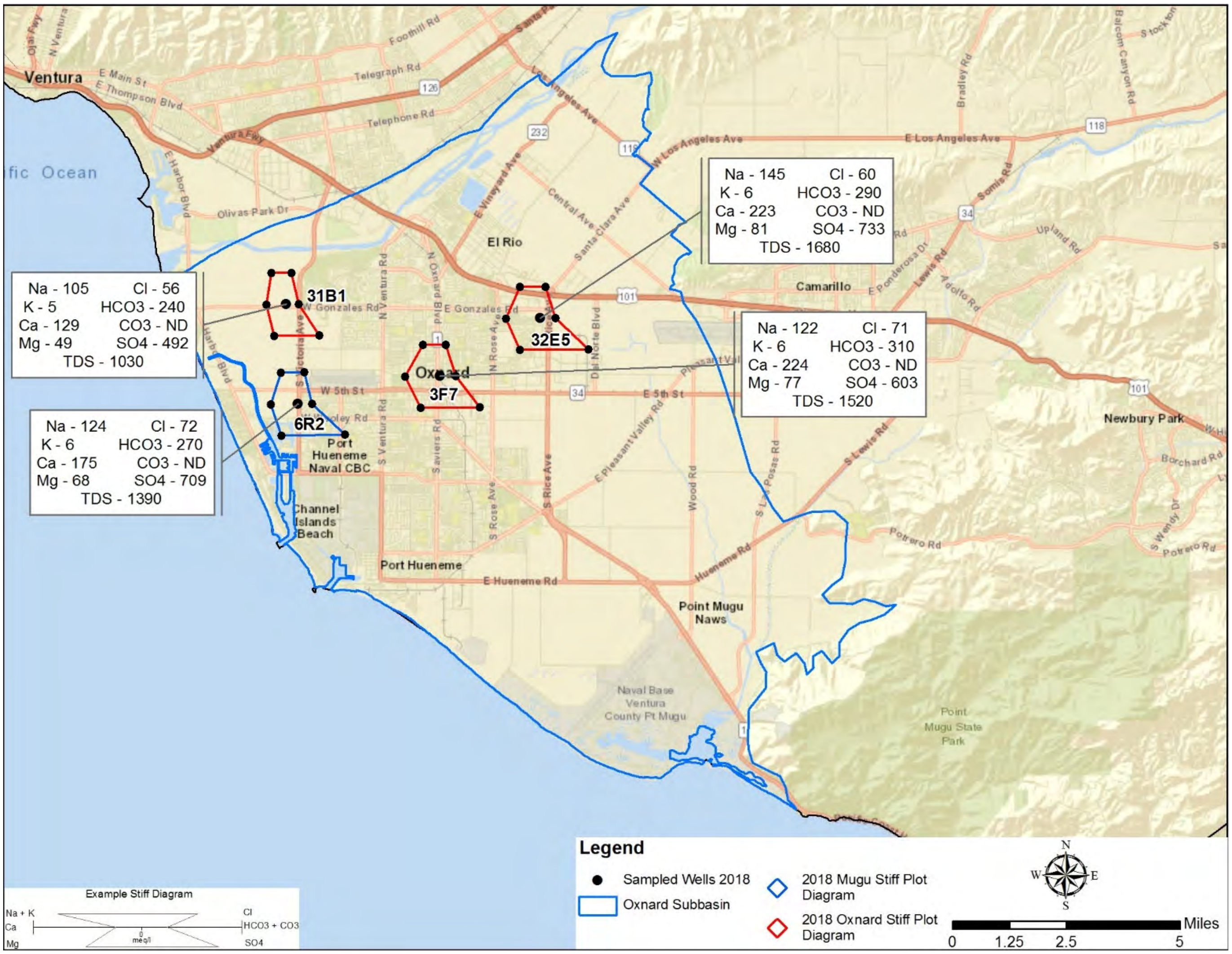


Figure 4-21: Oxnard Subbasin Upper Aquifer System sampled wells with Stiff diagrams and selected inorganic constituents.

Oxnard Aquifer

The Oxnard Aquifer is the shallowest of the confined aquifers and the most developed, based on the number of wells. Average depth to the main water-bearing unit is 80 feet bgs.

Water from two wells has manganese concentrations above the SMCL. Water samples from all three wells have TDS and sulfate concentrations above the SMCL. Sulfate concentrations range from 423 to 733 mg/L. TDS concentrations range from 1,000 to 1,680 mg/L. Water from one well has a nitrate concentration above the primary MCL. None of the samples were analyzed for Title 22 metals.

Table 4-11: Selected water quality results for wells screened in the Oxnard Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)

31B01	12/20/18	Oxnard	Upper	24.4	**1,030**	**492**	56	0.7
36E02	10/03/18	Oxnard	Upper	9	**1,000**	**423**	47	0.7
36E05	10/03/18	Oxnard	Upper	**50.7**	**1,680**	**733**	60	1

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

Groundwater plumes with elevated nitrate concentrations are common in the northern portion of the Subbasin. Nitrate sources include nitrogen-based fertilizers in agricultural areas and septic systems in residential areas.

Mugu Aquifer

The Mugu Aquifer is the lowest layer of the UAS and has similar physical and chemical characteristics to the Oxnard Aquifer with slightly better water quality, due to increasing depths where contaminants are less likely to infiltrate. Average depth to the main water-bearing unit is 200 feet bgs. One well perforated solely in the Mugu Aquifer was sampled in 2018. The water sample has sulfate and TDS concentrations above the primary MCL. The sample was not analyzed for Title 22 metals.

Table 4-12: Selected water quality results for wells screened in the Mugu Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Boron (mg/L)
24P02	11/27/18	Mugu	Upper	8.7	47	**400**	**960**	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

The Piper diagram in **Figure E-9** shows a comparison of wells sampled in the UAS and perforated in both Oxnard and the Mugu Aquifers. There is no dominant cation but the data plots closest to a calcium cation type. Four samples have no dominant anion but three plot closely to the sulfate type and one plots closely to the chloride type. Sulfate is the dominant anion for the remaining samples. The water in the UAS is best classified as a calcium-sulfate type.

4.4.11.3 Lower Aquifer System (LAS)

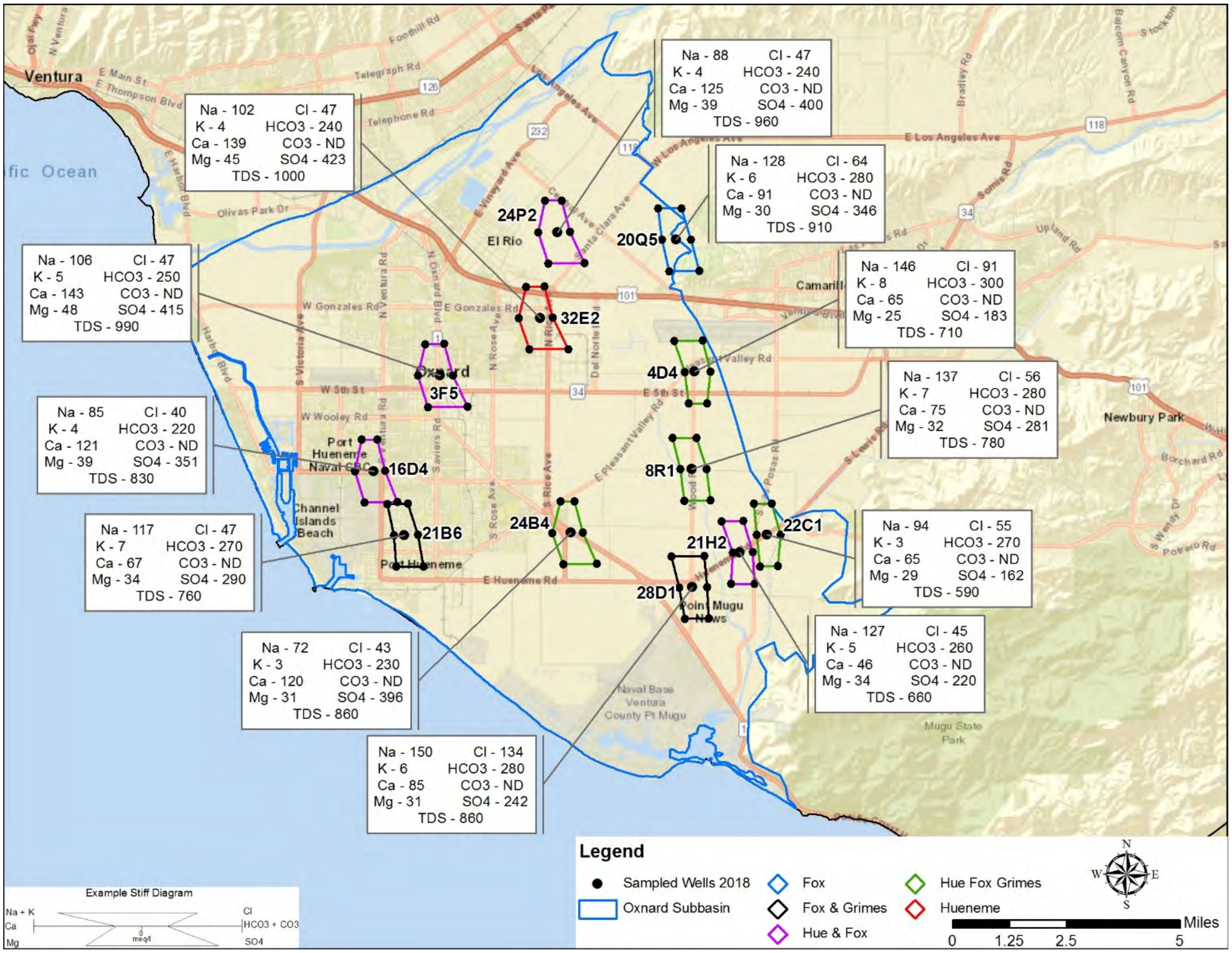


Figure 4-22 Oxnard Subbasin Lower Aquifer System sampled wells with Stiff diagrams and selected inorganic constituents.

Hueneme Aquifer

The Hueneme Aquifer is the shallowest of the LAS aquifers with the depth to the main water-bearing unit at approximately 375 feet bgs. Few wells are perforated exclusively in the Hueneme Aquifer making water quality determination for the Aquifer difficult. One well screened solely in the Hueneme Aquifer was sampled in 2018 (**Figure 4-22**). TDS, sulfate, and manganese concentrations are above the SMCL. The sample was not analyzed for Title 22 metals.

Table 4-13: Selected water quality results for wells screened in the Hueneme Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Boron (mg/L)
20Q05	11/28/2018	Hueneme	Lower	ND	64	**346**	**910**	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

Fox Canyon Aquifer

The Fox Canyon Aquifer is the second most-developed production zone in the Oxnard Subbasin, based on the number of wells and depth of perforations. One well perforated solely in the Fox Canyon Aquifer was sampled in 2018 (**Figure 4-22**). Depth to the main water-bearing unit is approximately 580 feet bgs. The Fox Canyon Aquifer generally has excellent water quality and high yield rates but is subject to seawater intrusion near Point Mugu and the Hueneme Submarine Canyon. Extractions are monitored and allocated by the FCGMA to mitigate aquifer overdraft and reduce seawater intrusion.

TDS is the only constituent that exceeded the SMCL. The sample was not analyzed for Title 22 metals.

Table 4-14: Selected water quality results for wells screened in the Fox Canyon Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Boron (mg/L)
21H02	10/01/18	Fox Canyon	Lower	ND	45	220	**660**	0.4

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

Hueneme & Fox Canyon Aquifers

Four Oxnard Subbasin wells that were sampled in 2018 are perforated across both the Hueneme and Fox Canyon Aquifers and referred to as LAS wells. Results for those wells are included in **Appendix D** and shown on the map of the LAS (**Figure 4-22**). SMCL concentrations were exceeded in three samples for manganese and two samples for sulfate. All four have TDS concentrations above the SMCL. TDS concentrations vary between 590 and 1,520 mg/L. Water samples from two Hueneme/Fox Canyon wells were analyzed for Title 22 metals and all constituents were below the primary MCL.

Table 4-15: Selected water quality results for wells screened in the Hueneme & Fox Canyon Aquifers.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Boron (mg/L)

22C01	10/01/18	Hueneme & Fox Canyon	Lower	ND	55	162	**590**	0.4
28D01	10/01/18	Hueneme & Fox Canyon	Lower	ND	134	242	**860**	0.7
03F05	10/03/18	Hueneme & Fox Canyon	Lower	15.9	47	**415**	**990**	0.7
03f07	10/03/18	Hueneme & Fox Canyon	Lower	15.6	71	**603**	**1,520**	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

Fox Canyon & Grimes Aquifers

Two Oxnard Subbasin wells sampled in 2018 are perforated in both the Fox Canyon and Grimes Canyon Aquifers. They are also referred to as LAS wells. Results for those wells are included in **Appendix D** and shown on the map of the LAS (**Figure 4-22)**. Sodium is the dominant cation and there is no dominant anion. Both water samples are sodium-sulfate type. Water from one well exceeded the drinking water SMCL concentration for manganese. Both samples have sulfate and TDS concentrations above the SMCL.

Table 4-16: Selected water quality results for wells in the Fox Canyon & Grimes Aquifers.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Boron (mg/L)
04D04	10/1/2018	Fox Canyon & Grimes	Lower	ND	91	**183**	**710**	0.4
08R01	10/1/2018	Fox Canyon & Grimes	Lower	ND	56	**281**	**780**	0.4

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

Hueneme, Fox Canyon & Grimes Aquifers

Four Oxnard Subbasin wells sampled in 2018 are perforated across the Hueneme, Fox Canyon and Grimes Canyon Aquifers. They are also referred to as LAS wells. Results for those wells are included in **Appendix D** and shown on the map of the LAS in **Figure 4-22**. The Piper diagram **Figure E-10** shows moderate variability in water quality. Calcium is the dominant cation in one sample with no dominant cation in the remaining three samples but plot closely to the calcium type. Sulfate is the dominant anion in all samples and the water is calcium-sulfate type.

Samples from three wells have manganese concentrations and all four have sulfate and TDS concentrations above the SMCL. TDS concentrations from these wells vary between 760 and 1,390 mg/L. Water samples from three Fox/Hueneme/Grimes wells were analyzed for Title 22 metals with all constituents below the primary MCL.

Table 4-17: Selected water quality results for wells screened in the Hueneme, Fox Canyon & Grimes Aquifers.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Boron (mg/L)
06R02	12/20/18	Hueneme, Fox Canyon, Grimes	Lower	6	72	**709**	**1,390**	0.9
16D04	12/18/18	Hueneme, Fox Canyon, Grimes	Lower	ND	40	**351**	**830**	0.7
21B06	12/18/18	Hueneme, Fox Canyon, Grimes	Lower	0.4	47	**290**	**760**	0.4
24B04	12/20/18	Hueneme, Fox Canyon, Grimes	Lower	0.6	43	**396**	**860**	0.7

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

The Piper diagram **Figure E-10** shows moderate variability in water quality of all wells sampled in the LAS. Sodium is the dominant cation in three samples. The other samples have no dominant cation but about half plot closely to the sodium type and half plot closely to the calcium type. Four samples have no dominant anion, but sulfate is the dominant anion for the remainder. Three water samples are sodium-sulfate type and the remainder are calcium-sulfate type.

The Piper diagram **Figure E-11** shows moderate variation between all wells sampled in the Oxnard Subbasin. Three wells have sodium as the dominant cation and the remainder have no dominant cation. Eleven samples have no dominant anion and sulfate is the dominant anion in the remainder. Three samples are sodium-sulfate type and the remainder are calcium-sulfate type.

4.4.12 Santa Clara River Valley Basin - Piru Subbasin (DWR Basin No. 4-004.06)

The Piru Subbasin groundwater recharge is principally from precipitation, water releases from Lake Piru by UWCD, and the Santa Clara River. Flow from the Santa Clara River enters the subbasin from the east and carries discharges from wastewater treatment plants and urban and stormwater runoff from Los Angeles County. There are approximately 152 water supply wells in the Piru Subbasin, of which 121 are active. Depth to the main water-bearing unit is approximately 30 to 90 feet bgs. On April 6, 2010, the LARWQCB adopted a Basin Plan Amendment that includes a Total Maximum Daily Load (TMDL) of 117 mg/L for chloride in surface water and 150 mg/L in groundwater for the stretch of the Santa Clara River in Ventura County east of Piru Creek.

Five wells were sampled in the Piru Subbasin in 2018. None of the groundwater sampled has a chloride concentration above the TMDL. The Piper diagram in **Figure E-12** shows low variability in water quality. There is no dominant cation for any samples but the data plots closest to the calcium cation type. Sulfate is the dominant anion for all samples and the water is calcium-sulfate type. The TDS concentrations exceed the SMCL in all samples and vary from 1,020 to 2,360 mg/L. Two samples have TDS concentrations above 1,500 mg/L. Sulfate concentrations exceed the SMCL in all samples. Two samples have manganese concentrations greater than the SMCL and two samples have nitrate concentrations greater than the primary MCL. **Figure 4-23** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate.

A water sample from one well was analyzed for Title 22 metals. The well has a selenium concentration over nine times the primary MCL. The concentrations for the remaining constituents were well below the primary MCL.

Table 4-18: Selected water quality results for the Piru Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
30J04	09/11/18	26.8	**1,020**	**396**	116	0.6
25M03	09/11/18	**46.8**	**2,360**	**1,180**	72	0.9
26H01	09/11/18	21.3	**1,110**	**421**	113	0.7
26J02	09/11/18	28.3	**1,910**	**916**	62	1
34J04	11/14/18	**70.6**	**1,230**	**483**	70	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

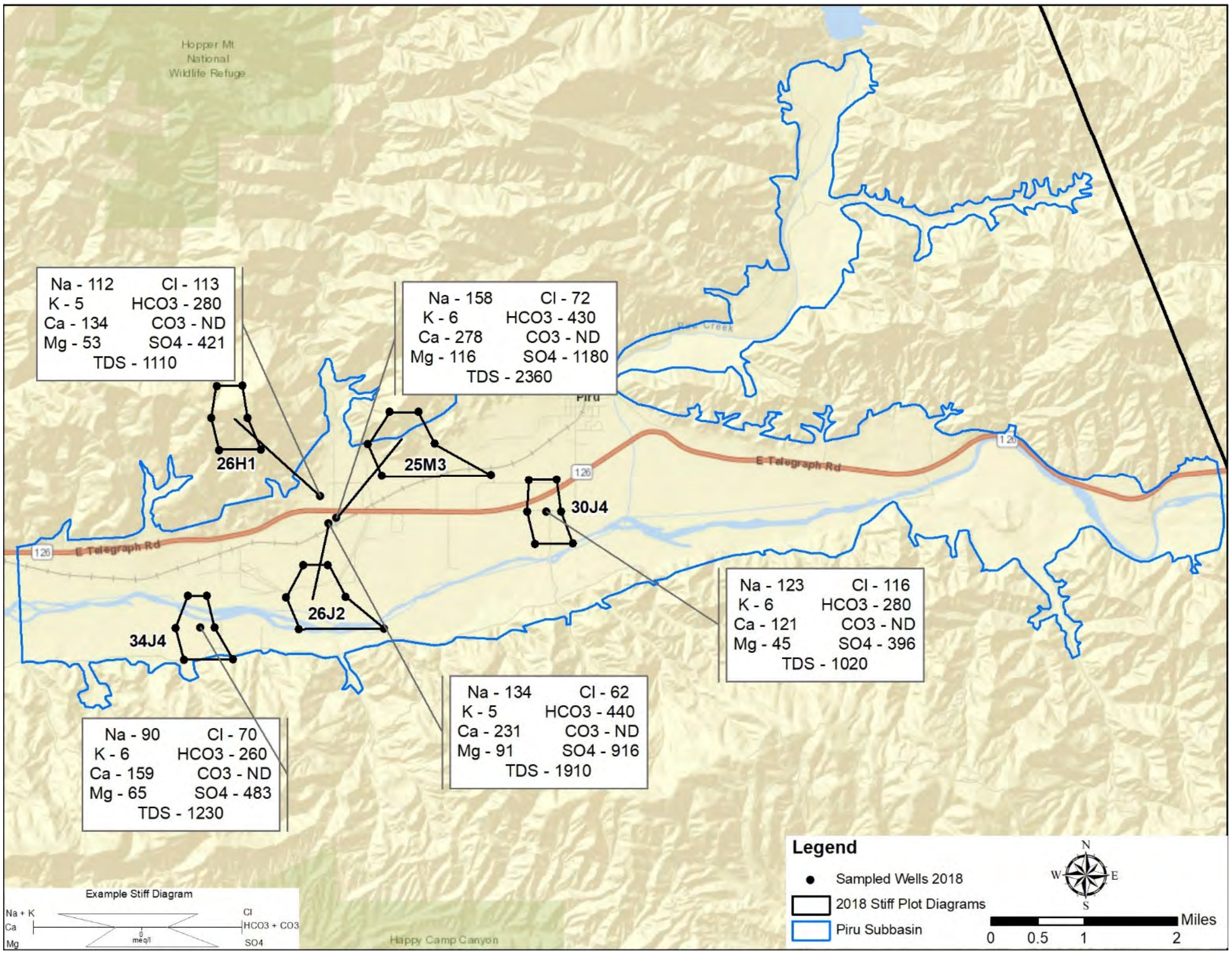


Figure 4-23: Piru Basin sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.13 Pleasant Valley Basin (DWR Basin No. 4-006)

Pleasant Valley Basin groundwater quality can vary greatly throughout the basin. The upper-most water-bearing unit at 35 to 60 feet bgs is not used due to very poor water quality. Permeable lenses of alluvial sands, gravels, silts and clays of recent to Upper Pleistocene age that vary in thickness from a few feet to several hundred feet are equivalent to but not connected with the Oxnard Aquifer and are referred to as the Upper Zone. Depth to the main water-bearing unit is approximately 400 to 500 feet bgs. This deeper zone is referred to as the Lower Zone. It is made up of marine sands and gravels of the lower-most member of the early Pleistocene San Pedro Formation and is known as the Fox Canyon Aquifer. The Grimes Canyon Aquifer underlies the Fox Canyon Aquifer at depths below 1,000 feet bgs and is perforated by only the deepest wells. There are approximately 341 water supply wells in the Pleasant Valley Basin, of which 86 are active. Thirteen wells were sampled in 2018 with three perforated in the Upper Zone and 10 perforated in the Lower Zone.

The Piper diagram in **Figure E-13** shows a comparison of wells perforated in the Upper Zone with those perforated in the Lower Zone. Wells perforated in the Upper Zone tend to have higher concentrations of sulfate than those in the Lower Zone but in general the Upper and Lower aquifer systems show similar water quality. The Piper diagram shows moderate variability in water quality. In the Upper Zone, calcium is the dominant cation in one sample, sodium is the dominant cation in one sample, and the remaining two samples have no dominant cation but plot closely to the calcium type. In the Lower Zone, sulfate is the dominant anion in nine samples with no dominant anion for the remaining sample. Most of the data plots closely to the sulfate type. The water in one sample is sodium-sulfate type and the remainder are calcium-sulfate type.

TDS concentrations in all water samples (Upper and Lower Zones) vary from 710 to 4,650 mg/L. All thirteen wells sampled have TDS concentrations above the SMCL. Twelve wells have sulfate concentrations above the SMCL. One sample has an iron concentration above the SMCL and seven have manganese concentrations above the SMCL. Chloride concentrations are above the SMCL in one well and nine are above a concentration that can impair agricultural beneficial uses. Four water samples were analyzed for Title 22 metals. None of the analyses were above the primary MCL. **Figure 4-24** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate.

Table 4-19: Selected water quality results for the Pleasant Valley Basin.

Well No.	Date Sampled	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
01B05	12/12/2018	Lower	ND	**800**	56.1	220	0.3
03K01	10/1/2018	Lower	**49.2**	**1,180**	**431**	120	0.4
03R01	10/1/2018	Lower	**45.2**	**1,850**	**704**	228	0.6
04K01	10/1/2018	Lower	ND	**920**	**291**	116	0.5
10G01	10/1/2018	Lower	14.5	**1,440**	**510**	192	0.4
15D02	10/1/2018	Lower	1.4	**1,330**	**458**	194	0.5
19L05	12/17/2018	Lower	0.6	**1,750**	**849**	146	0.7
29B02	12/12/2018	Lower	5.2	**750**	164	123	0.2
33R02	12/12/2018	Lower	ND	**760**	209	109	0.4
34G01	10/1/2018	Lower	ND	**1,180**	**329**	191	0.8
10A02	12/20/2018	Upper	**78.7**	**2,310**	**1,080**	240	0.5
12D01	12/12/2018	Upper	ND	**2,340**	**848**	**330**	0.7
15H01	12/12/2018	Upper	ND	**4,580**	**2,270**	**660**	1.7

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

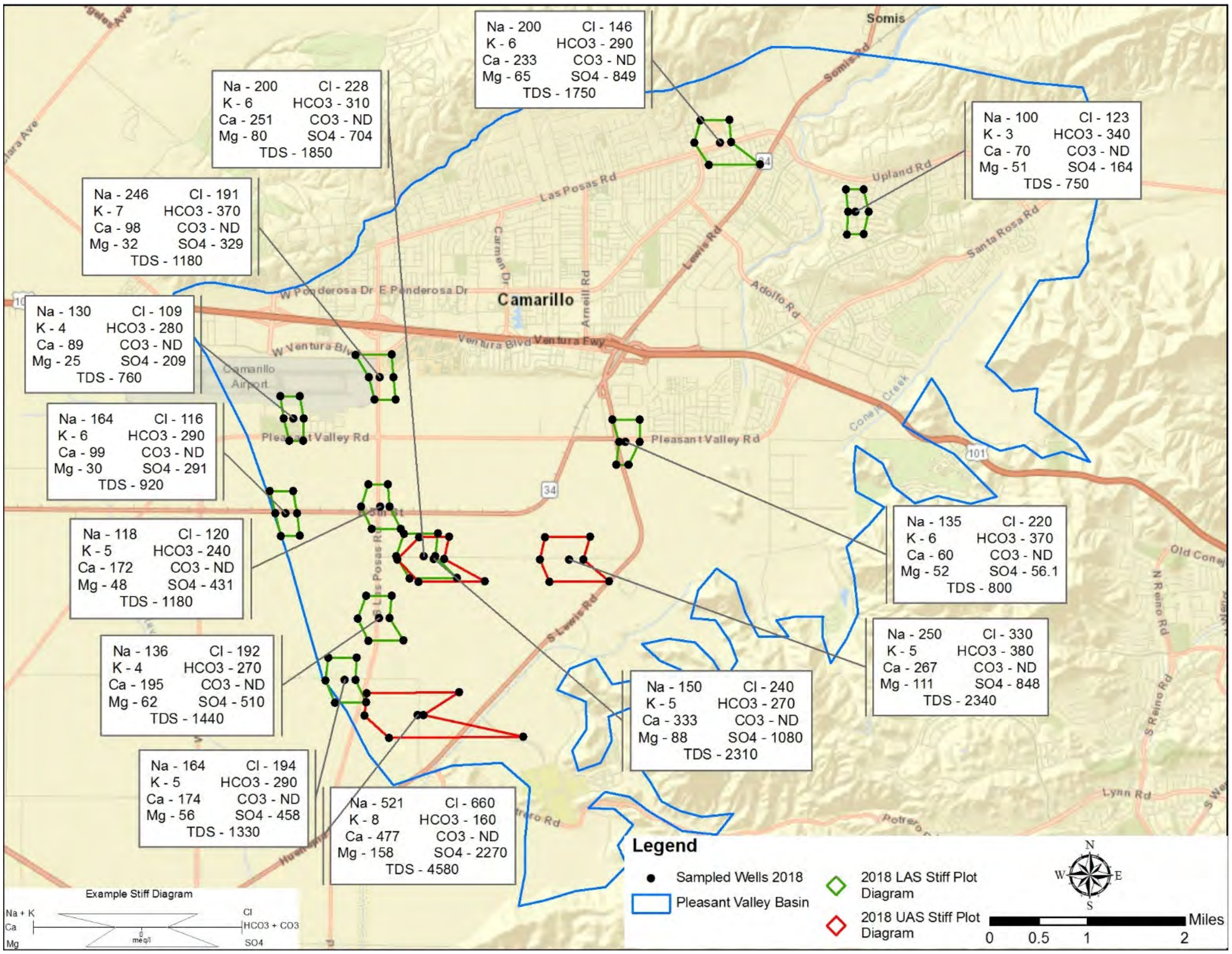


Figure 4-24: Pleasant Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.14 Santa Clara River Valley Basin - Santa Paula Subbasin (DWR Basin No. 4-004.04)

The Santa Paula Subbasin is a court adjudicated groundwater basin. To mitigate overdraft, a June 1991 judgement ordered the creation of the Santa Paula Basin Pumpers Association (SPBPA). The SPBPA regulates extractions in the Santa Paula Subbasin. The judgement stipulated an allotment of 27,000 acre-feet per year (AFY) could be pumped from the Subbasin. Water quality in the Subbasin has not changed substantially since 2007. The depth to the water-bearing unit is 65 to 160 feet bgs. There are approximately 330 water supply wells in the Santa Paula Subbasin, of which 179 are active. Water from one well was analyzed. The Piper diagram in **Figure E-14** shows no significant change in the water quality since previous sampling. Calcium is the dominant cation in one sample and the remaining four have no dominant cation. Sulfate is the dominant anion and the water is calcium-sulfate type. TDS concentration is above the SMCL. The sample has concentrations above the SMCL for sulfate, iron and manganese. The sample was not analyzed for Title 22 metals. **Figure 4-25** shows approximate well location and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for well sampled.

Figure E-20 compares water samples from the up-gradient Piru and Fillmore Subbasins to the Santa Paula Subbasin. The Piper diagram shows low variability among the samples, and they are all calcium-sulfate water types.

Table 4-20: Selected water quality results for the Santa Paula Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
03E01	10/03/18	0.9	**2,090**	**923**	94	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

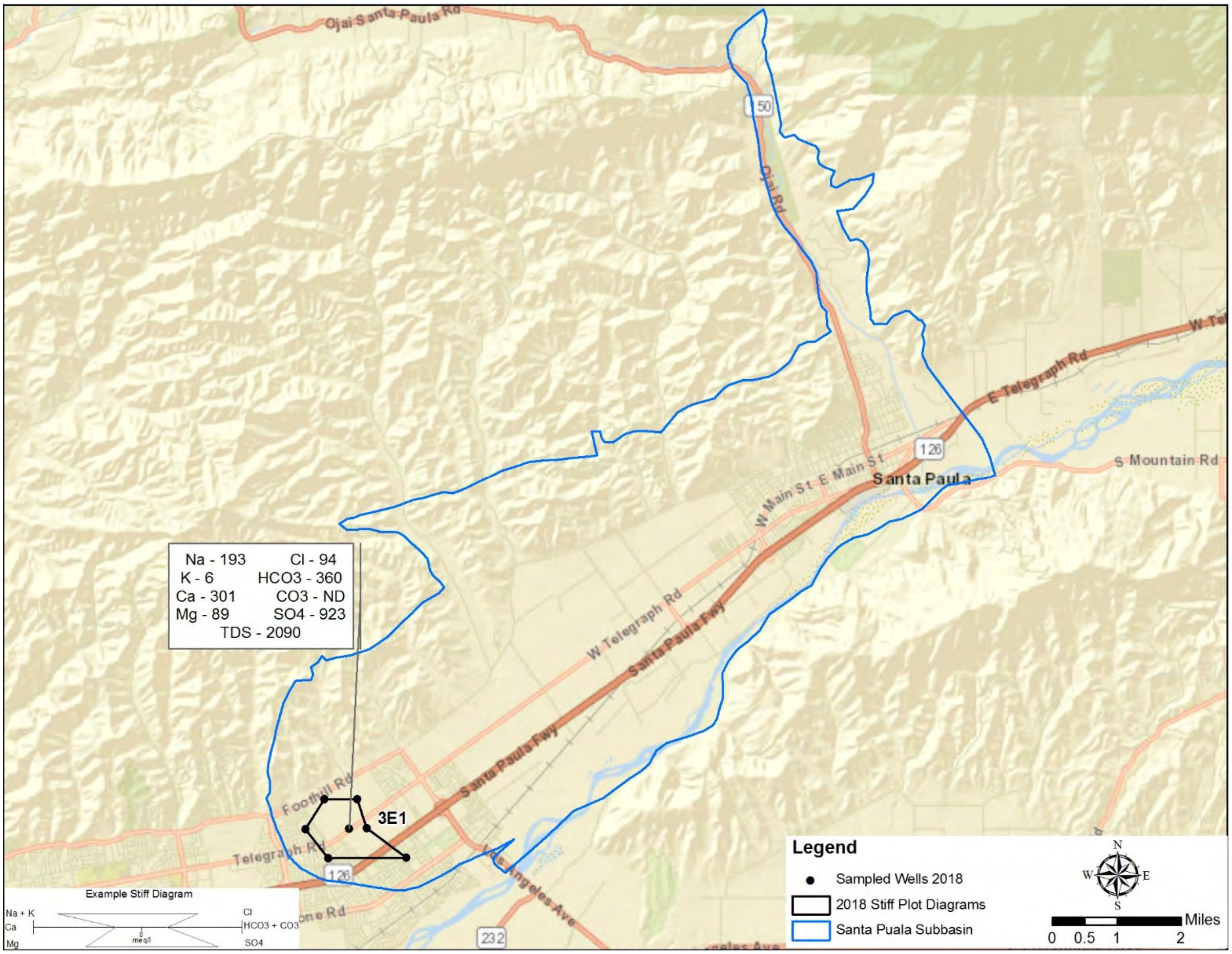


Figure 4-25: Santa Paula Subbasin sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.15 Hidden Valley Basin (DWR Basin No. 4-016)

The Hidden Valley Basin consists mainly of fractured volcanic rock providing inconsistent groundwater supply throughout the basin because much of the water is stored in fractures. The water quality varies because of the heterogeneous nature of the aquifer. There are approximately 149 water supply wells in the Hidden Valley Basin, of which 98 are active. No wells were sampled in the basin in 2018. **Figure 4-26** shows the extent of the Hidden Valley Basin.

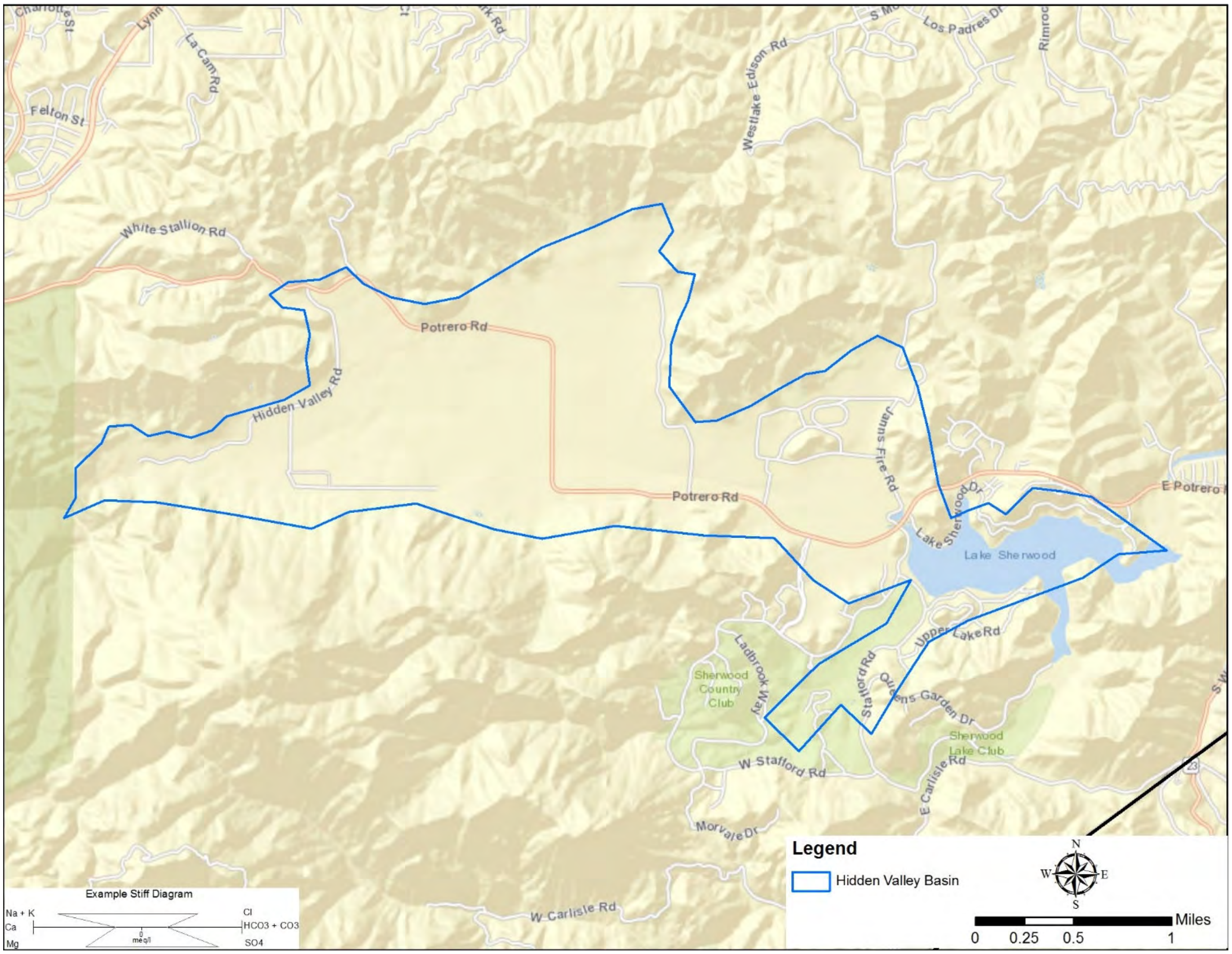


Figure 4-26: Hidden Valley Basin

4.4.16 Simi Valley Basin (DWR Basin No. 4-009)

The Simi Valley Basin drains to the west and historically, water quality becomes more enriched in salts and poorer quality further west in the basin. The three wells sampled are in the western end of the valley. There are approximately 182 water supply wells in the Simi Valley Basin, of which 40 are active. Depth to the water-bearing unit is approximately 5 to 25 feet bgs. The City of Simi Valley has a high water-table at the western end of the valley and several dewatering wells have been installed to reduce the water table. The Piper diagram in **Figure E-15** shows low variability in water quality. There is no dominant cation, but the samples plot closely to the calcium type. Sulfate is the dominant anion in all three samples. and the water is calcium-sulfate type. TDS and sulfate concentrations in all three wells are above the SMCL. One well has nitrate and one well has manganese above the MCL. Three samples have chloride concentrations that could cause impairment of agricultural beneficial uses for sensitive plants but are not above the primary MCL. One water sample was analyzed for Title 22 metals and all constituents are below the MCL. **Figure 4-27** shows approximate well locations and concentrations of TDS, sodium potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for wells sampled in the Simi Valley Basin.

Table 4-21: Selected water quality results for the Simi Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
08D04	9/5/2018	17.1	**1,830**	**760**	163	1.1
08K07	9/5/2018	**55.8**	**2,070**	**917**	160	1
09E01	9/5/2018	29.5	**1,650**	**726**	127	0.8

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

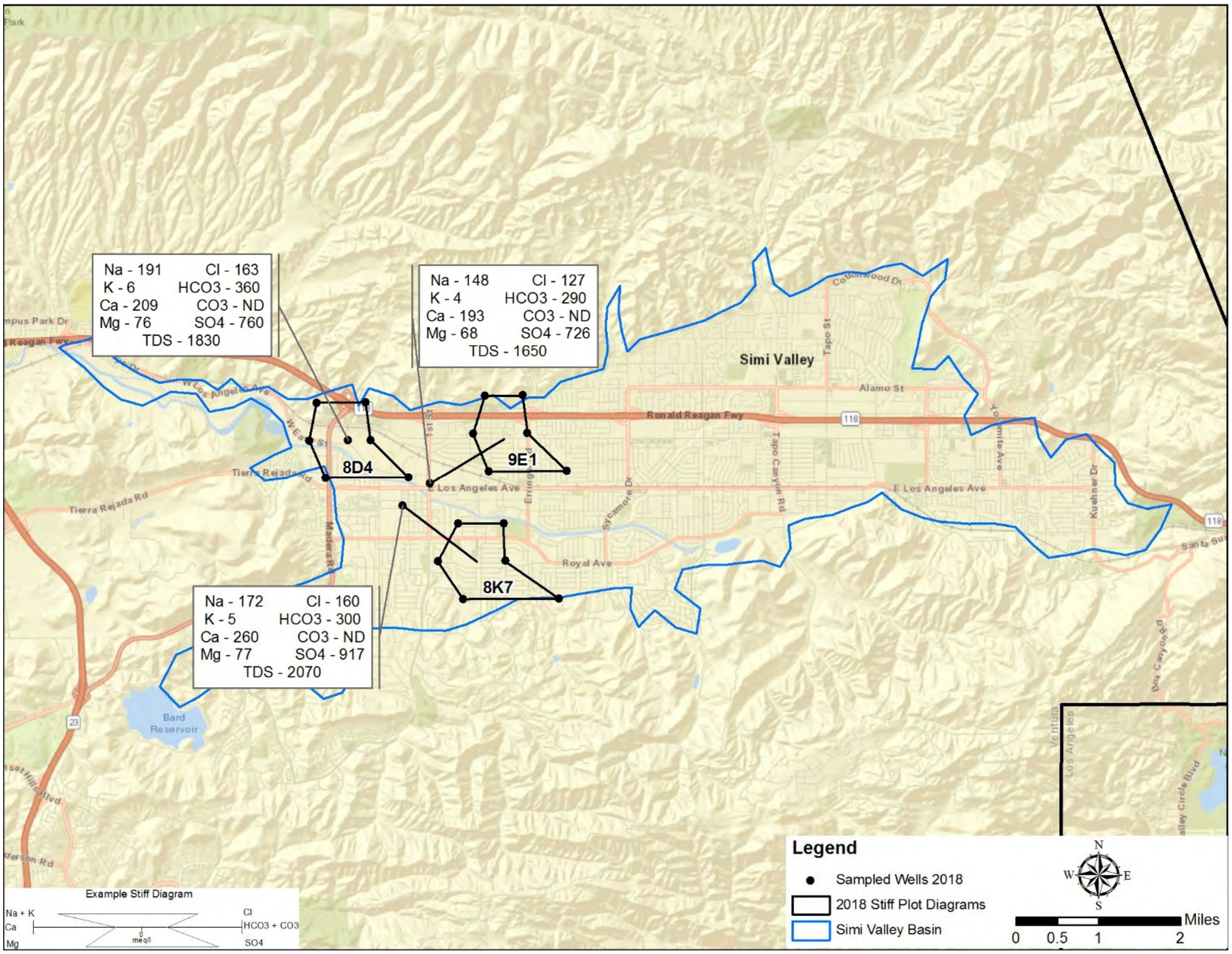
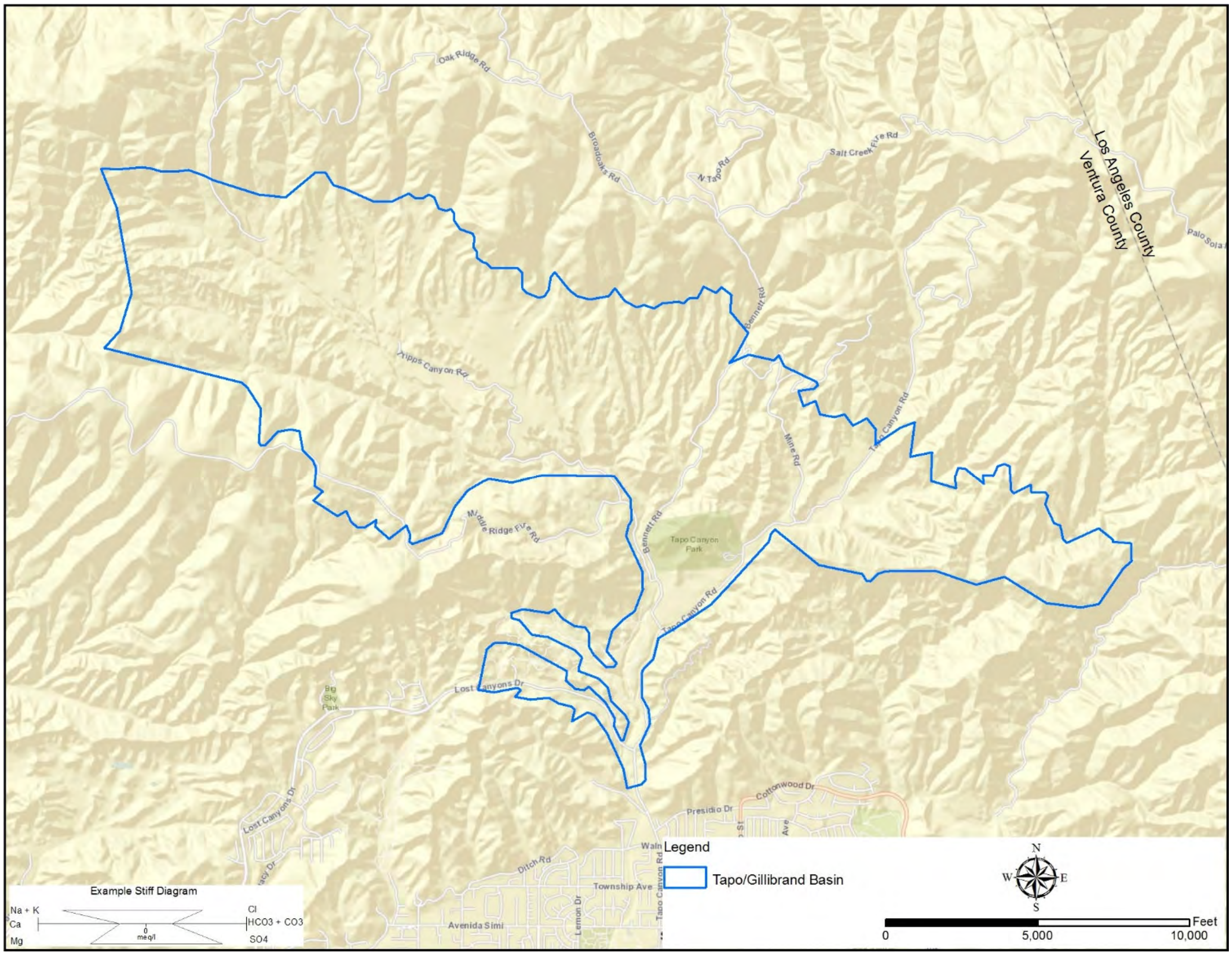


Figure 4-27: Simi Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.17 Tapo/Gillibrand Basin

The Tapo/Gillibrand Basin is located to the north of Simi Valley. The Tapo/Gillibrand Basin is an east-west trending structural basin that consists of permeable sand and gravel that occur near the center of the Happy Camp Syncline. The basin is bounded by the Santa Susana Fault to the north, the Simi Anticline to the south and impermeable sediments of the Sisquoc Formation and Monterey Shale in the remaining areas. There are approximately 46 water supply wells in the Tapo/Gillibrand Basin, of which 14 are active. The City of Simi Valley operates several wells in the basin for backup water supply. No wells were sampled in this basin in 2018. **Figure 4-28** shows the extent of the Basin.



<u>Figure 4-28</u>: Tapo/Gillibrand Basin.

4.4.18 Thousand Oaks Area Basin (DWR No. 4-019)

The Thousand Oaks Area Basin has very few active water wells available for sampling. The depth to the water-bearing unit is approximately 25 to 30 feet bgs. The groundwater basin underlies a small valley between Lake Sherwood and the City of Thousand Oaks, just east of Highway 23. Water-bearing formations are mainly alluvium and fractured Conejo Volcanics. There are approximately 119 water supply wells in the basin, of which 13 are active. No wells were sampled in this basin in 2018. **Figure 4-29** shows the extent of the Thousand Oaks Area Basin.

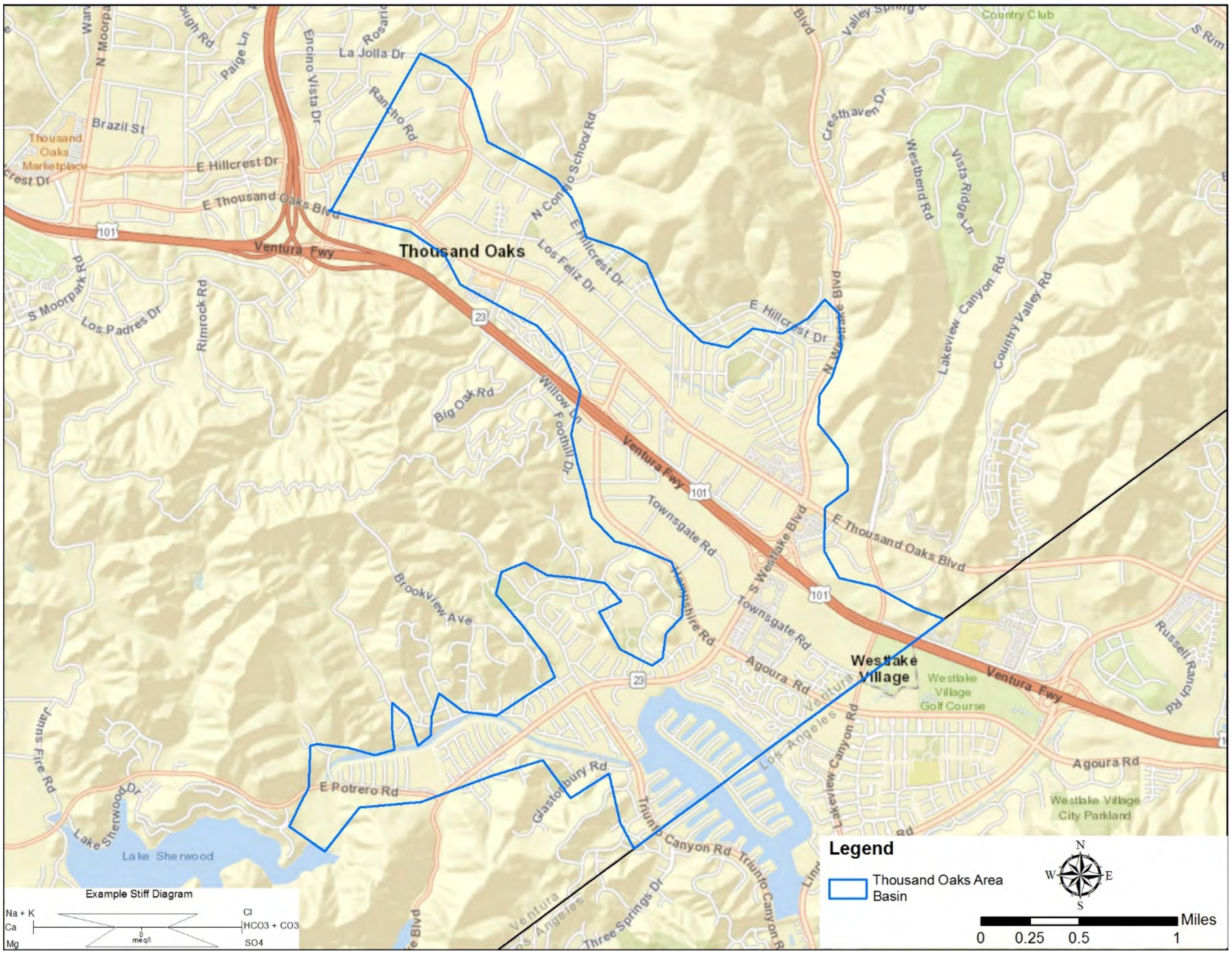


Figure 4-29: Thousand Oaks Area Basin.

4.4.19 Tierra Rejada Valley Basin (DWR Basin No. 4-015)

Depth to water-bearing materials varies between 20 to 80 feet bgs. There are approximately 58 water supply wells in the Tierra Rejada Valley Basin, of which 37 are active. Seven wells were sampled in 2018. The Piper diagram in **Figure E-16** shows some variation in water quality. The dominant cation for one sample is magnesium and the remainder have no dominant cation but plot closely to the magnesium type. The dominant anion for one sample is bicarbonate and the remainder have no dominant anion. One well is magnesium-bicarbonate type and the remaining six are magnesium-sulfate type. One well has a nitrate concentration above the primary MCL. Water from all seven wells has TDS concentrations above the SMCL, ranging from 630 to 1,180 mg/L. One sample has manganese and one has sulfate above the SMCL. Two wells in the basin were analyzed for Title 22 metals and all constituents were below the primary MCL.

The Piper diagram in **Figure E-3** shows a comparison of water chemistry between Tierra Rejada and Arroyo Santa Rosa Basins. Chemistry in the two basins is similar but there is more variation in Tierra Rejada with slightly higher magnesium, bicarbonate, and sulfate. **Figure 4-30** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate.

Table 4-22: Selected water quality results for the Tierra Rejada Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
10R02	09/05/18	10.9	**700**	172	74	0.1
11J03	09/05/18	24.5	**670**	172	69	0.2
14F01	09/05/18	**71.6**	**840**	137	120	0.1
14Q02	09/05/18	0.9	**630**	158	57	ND
15B01	09/05/18	11.7	**760**	198	109	ND
15J02	09/05/18	15.2	**1,180**	**306**	169	0.2
15N03	12/17/18	1	**630**	170	84	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

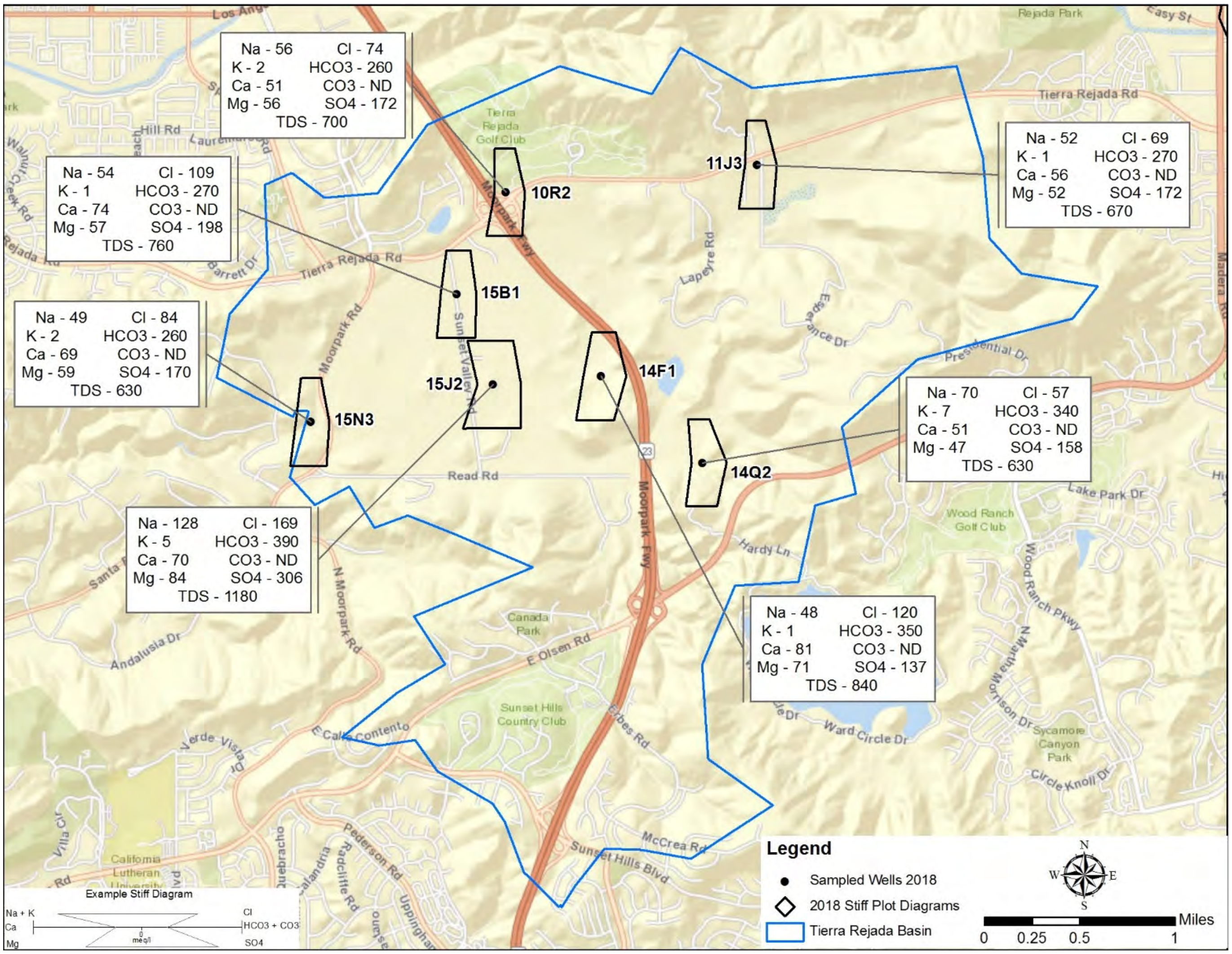


Figure 4-30: Tierra Rejada Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Figure 4-31 shows nitrate concentrations for wells sampled in the Tierra Rejada Valley Basin in 2018. Groundwater from one well sampled has a nitrate concentration that exceeds the primary MCL. Other wells previously sampled with elevated nitrate concentrations were not available for sampling in 2018.

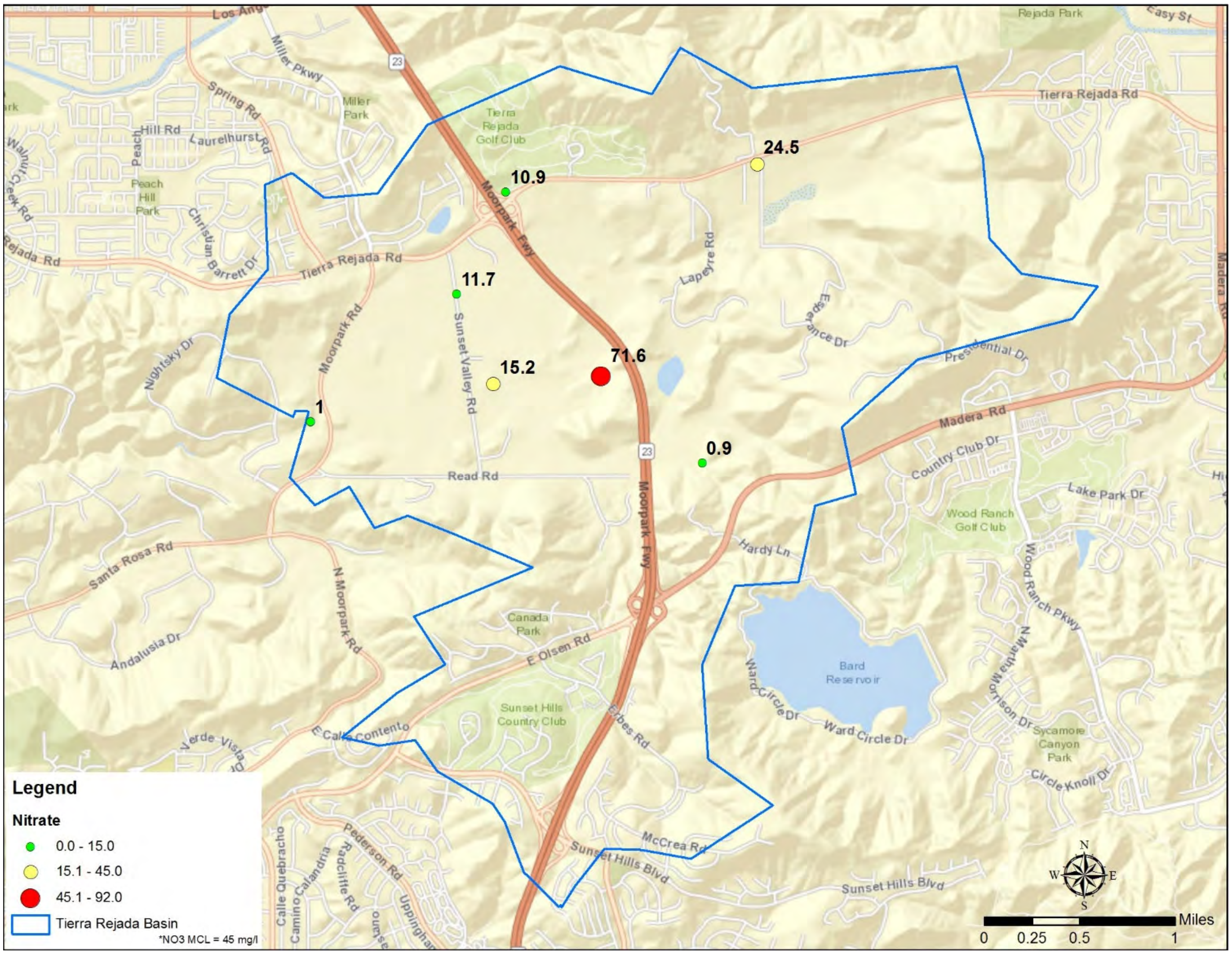


Figure 4-31: Tierra Rejada Basin location of sampled wells and nitrate concentrations.

4.4.20 Upper Ojai Valley Basin (DWR Basin No. 4-001)

The Upper Ojai Valley Basin is a small, linear valley southeast of and at a higher elevation than the Ojai Valley Basin. The average thickness of water-bearing deposits is approximately 60 feet and is encountered approximately 45 to 60 feet bgs. Groundwater quality is considered good but varies seasonally and usually has better quality during winter months. There are approximately 167 water supply wells in the Upper Ojai Valley Basin, of which 126 are active. Three wells were sampled in 2018. The Piper diagram in **Figure E-17** shows little variation in the water quality of wells. Calcium is the dominant cation in two samples and there is no dominant cation in the third sample but plots closely to the calcium cation type. Bicarbonate is the dominant anion, and the water is calcium-bicarbonate type in all three samples.

TDS is above the SMCL in one sample and manganese is above the SMCL in two samples. One sample has a nitrate concentration above the primary MCL. Two water samples were analyzed for Title 22 metals and all constituents were below the primary MCL. **Figure 4-32** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 4-23: Selected Water Quality Results for the Upper Ojai Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
10K05	11/13/18	3.7	**750**	118	93	0.2
11J01	11/15/18	**47.2**	430	78.2	34	ND
11P01	11/15/18	ND	250	0.9	12	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

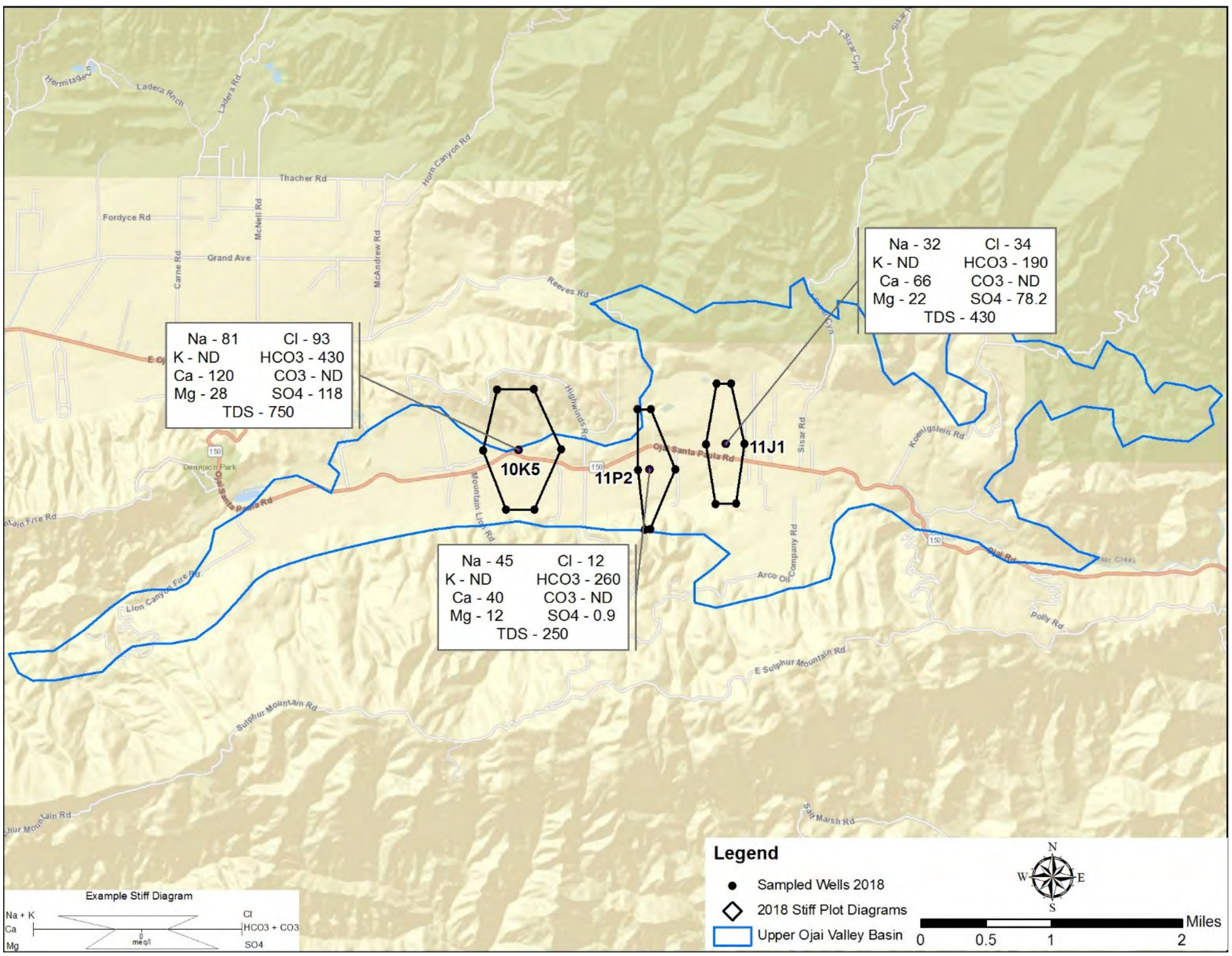


Figure 4-32: Upper Ojai Basin sampled wells with Stiff diagrams and selected inorganic constituents.

4.4.21 Ventura River Valley – Lower Ventura River Subbasin (DWR Basin No. 4-003.02)

The Lower Ventura River Subbasin is commonly defined at a point coinciding with the City of Ventura's submerged dam at Foster Park and extending to the Pacific Ocean. The Subbasin shares a common boundary with the Mound Subbasin at its lower reach. Canada Larga and several smaller tributary canyons are also part of the Subbasin. The water-bearing unit consists of alluvial sand and gravel with abundant cobbles and ranges in thickness from 60 to 200 feet and perhaps up to 300 feet at the mouth of the Ventura River. Depth to the water-bearing unit is 3 to 13 feet bgs in the floodplain and deeper as the ground surface elevation increases towards the edges of the Subbasin. There are approximately 33 wells in the Lower Ventura River Basin, of which 20 are active. One well was sampled in 2018. The water sample has TDS and sulfate concentration that exceeds the SMCL. The water was not analyzed for Title 22 metals. **Figure 4-33** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate for the well. The Piper diagram in **Figure E-18** shows the water quality of the sample. There is no dominant cation or anion in the sample. The water is calcium-sulfate type.

Table 4-24: Selected water quality results for the Lower Ventura River Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
05K01	11/19/18	ND	**1,230**	**360**	175	0.8

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

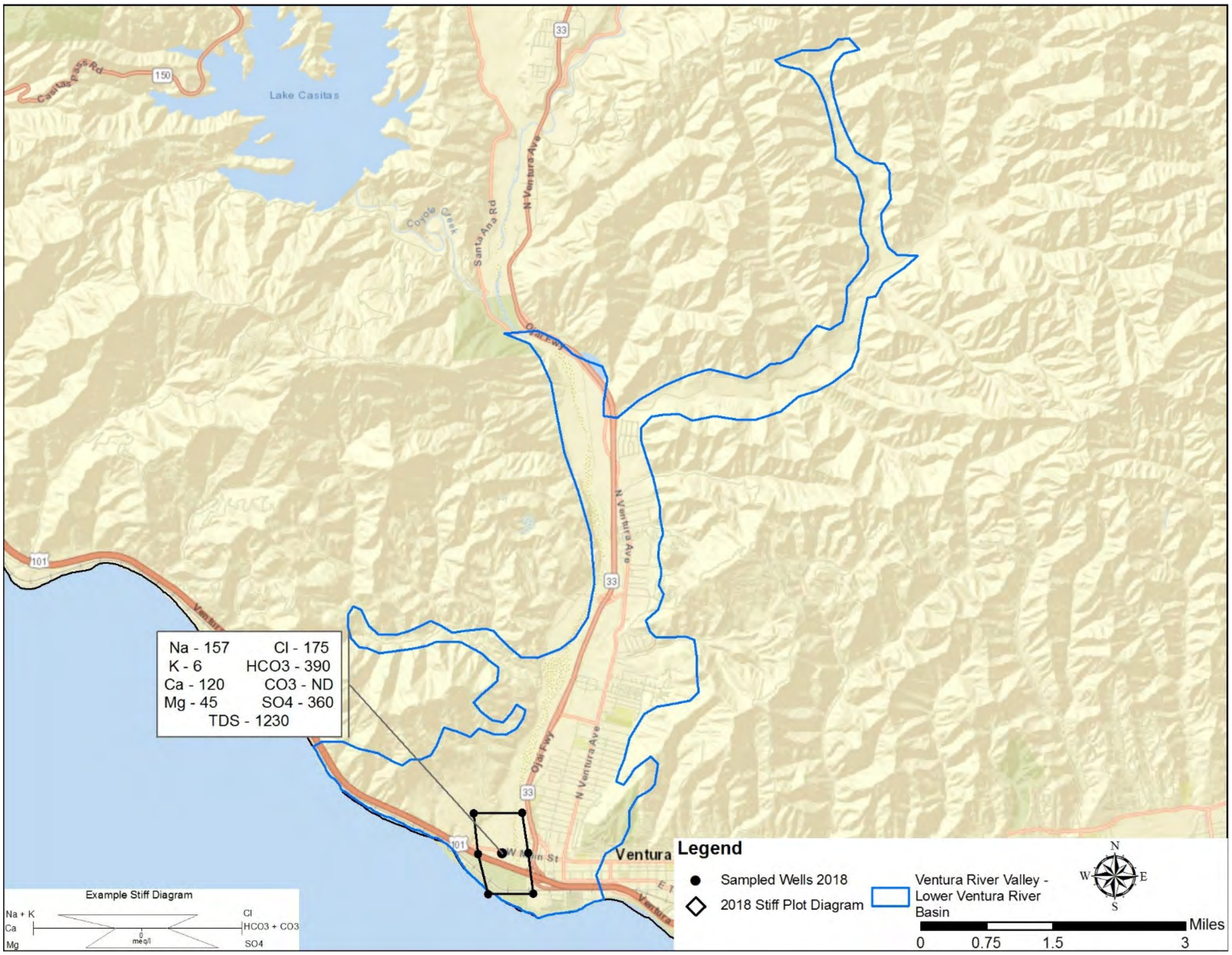


Figure 4-33: Ventura River Valley – Lower Ventura River Subbasin sampled well with Stiff diagram and selected inorganic constituents.

4.4.22 Ventura River Valley – Upper Ventura River Subbasin (DWR Basin No. 4-003.01)

The Upper Ventura River Subbasin is mainly composed of thin alluvial deposits. There are approximately 202 water supply wells in the Upper Ventura River Subbasin, of which 121 are active. The Piper diagram in **Figure E-19** shows low variation in water quality among the samples. The dominant cation in the Upper Ventura River Subbasin is calcium with no dominant anion. The water is calcium-sulfate type.

One well was sampled and the water sample has as TDS concentration that exceeds the SMCL. The sample was not analyzed for Title 22 metals. **Figure 4-34** shows the approximate well location and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate, and sulfate for the well. The Piper diagram in **Figure E-19** shows the water quality of the sample. Calcium is the dominant cation and there is no dominant anion in the sample. The water is calcium-sulfate type.

Table 4-25: Selected water quality results for the Upper Ventura River Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
09G03	11/20/18	40.5	**830**	180	88	0.5

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

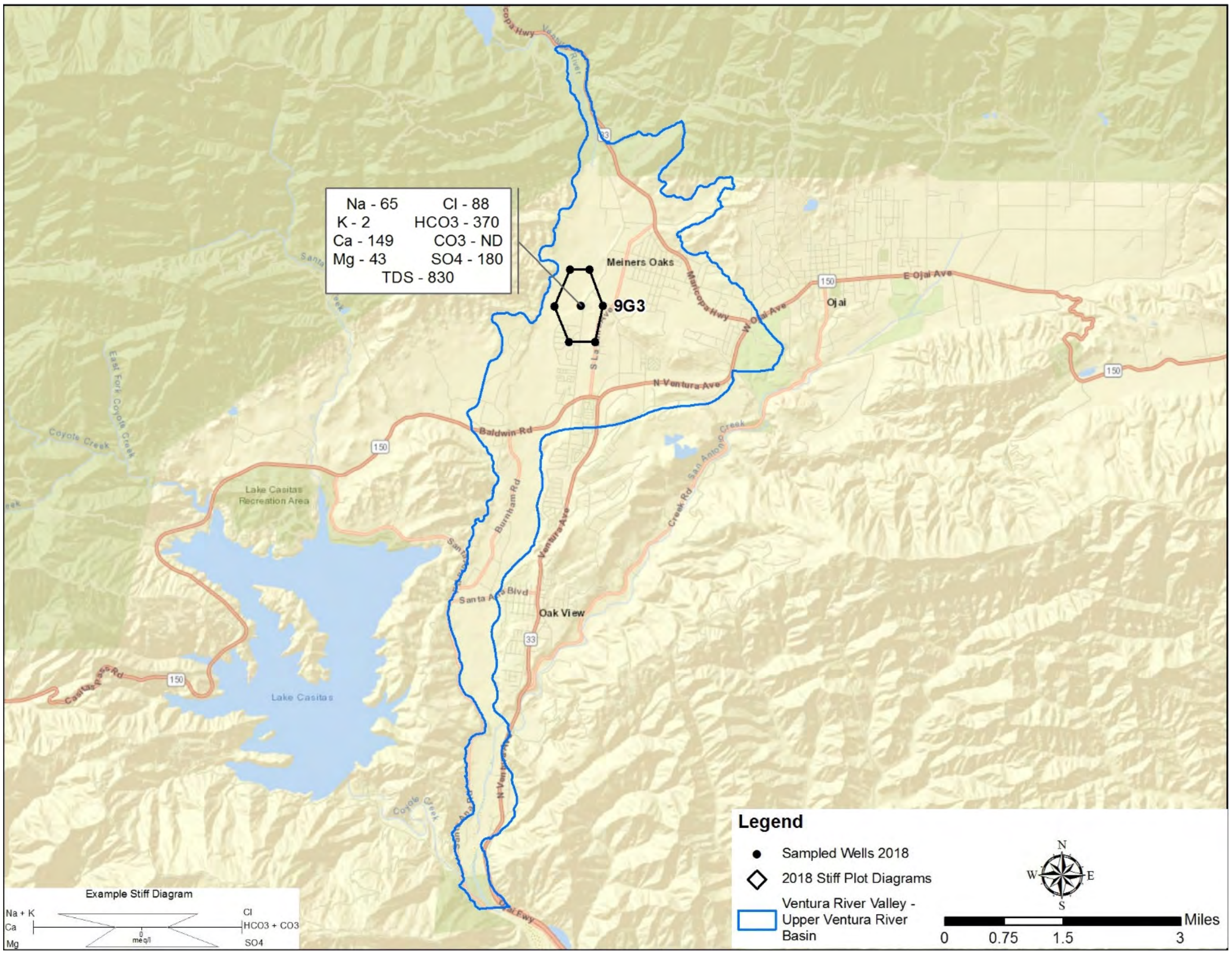


Figure 4-34: Ventura River Valley – Upper Ventura River Subbasin sampled well with Stiff diagram and selected inorganic constituents.

5.0 Groundwater Elevations

Groundwater elevations are measured in production and monitoring wells throughout the County. Water levels are tracked to determine change in storage and trends in groundwater extraction and recharge. Elevation data is shared with other organizations and agencies. The data is also used to generate groundwater elevation maps to determine the direction of groundwater movement. Collected data is publicly available.

In 2018 approximately 200 wells throughout the County (**Figures 5-1 and 5-2**) were gauged, including seventeen designated as “key” wells, considered to represent groundwater elevations over a broad area of a groundwater basin. Key wells[8] were chosen based on location in a basin, availability of construction information and historical water level data. Water levels are measured quarterly in the southern half of the County and bi-annually in the northern half.

The gauged wells include wells that are not in operation and active wells that were not pumping for at least 24 hours prior to water level gauging. Same wells are consistently gauged. However, alternative wells are substituted when primary wells cannot be gauged.

[8] Appendix B includes the location of key wells, water level changes and hydrographs.

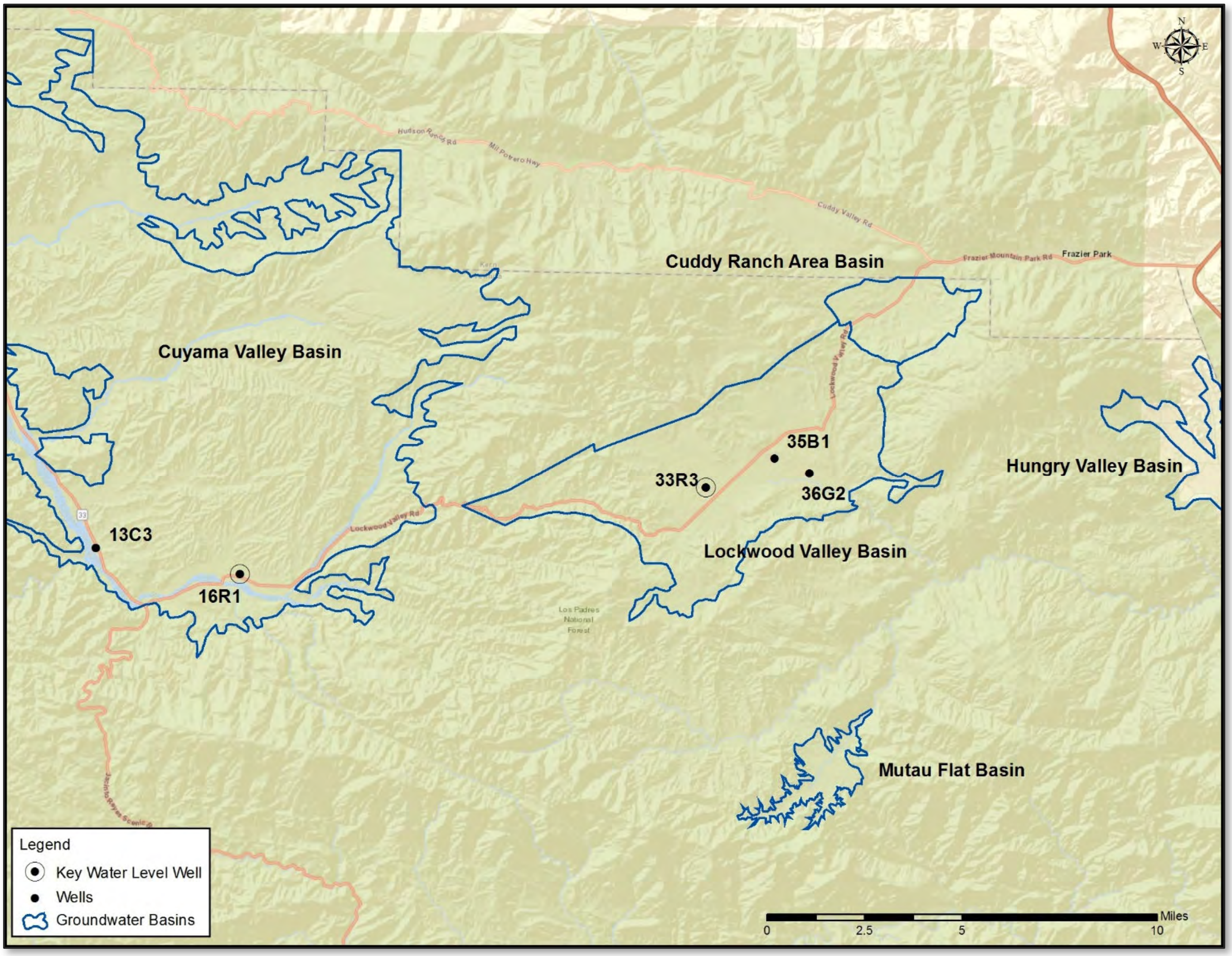


Figure 5-1: Water level wells measured in the northern half of the County.

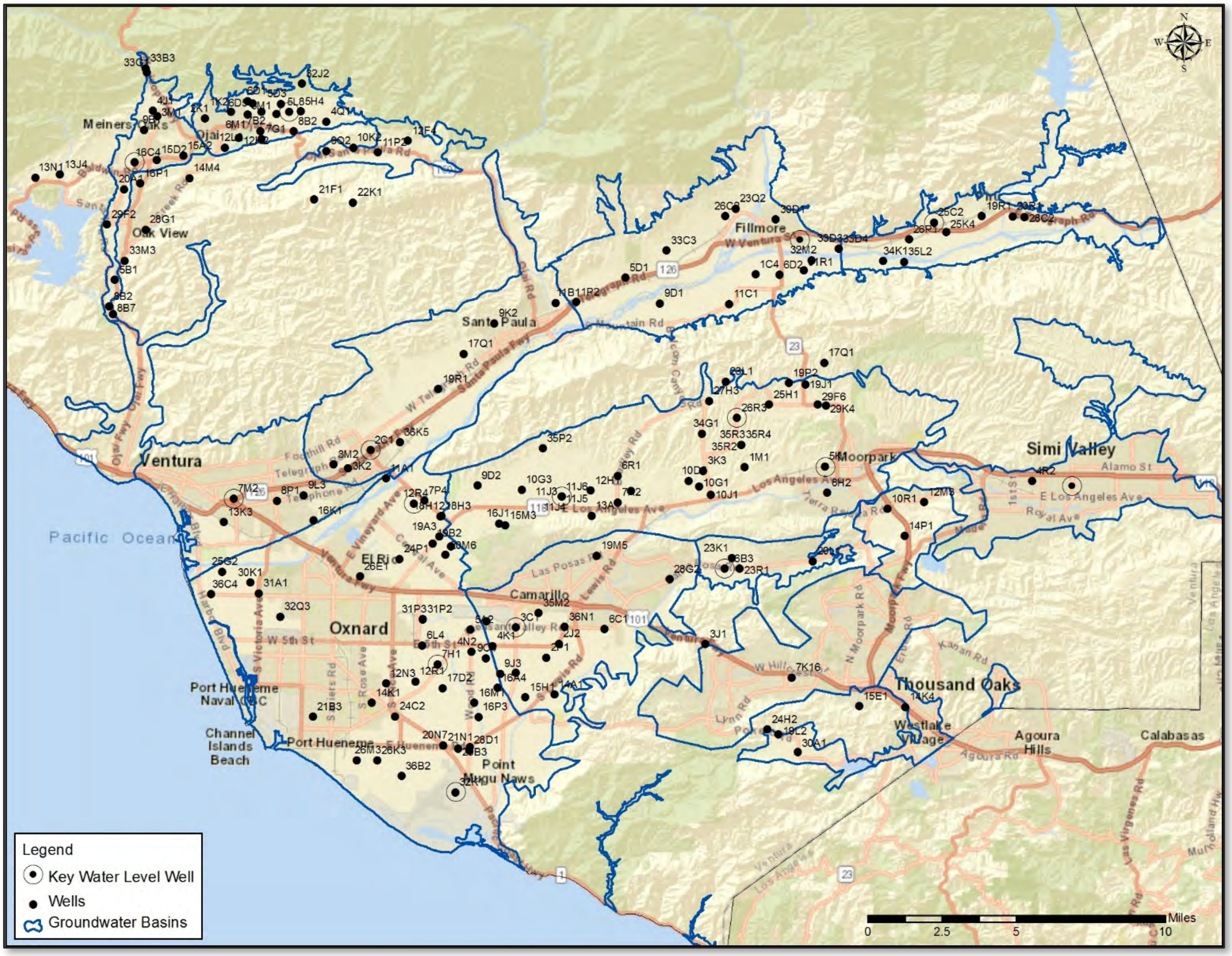


Figure 5-2: Water level wells measured in the southern half of the County.

5.1 Water Level Hydrographs

The gauged wells include wells that are not in operation and active wells that were not pumping for at least 24 hours prior to water level gauging. Same wells are consistently gauged. However, alternative wells are substituted when primary wells cannot be gauged. The data along with climate, stream flow, groundwater recharge, groundwater quality and pumping data are used to evaluate groundwater conditions. Hydrographs for all key wells are shown in **Appendix B**. An example hydrograph for State Well No. (SWN) 01N21W02J02S is shown in **Figure 5-3**.

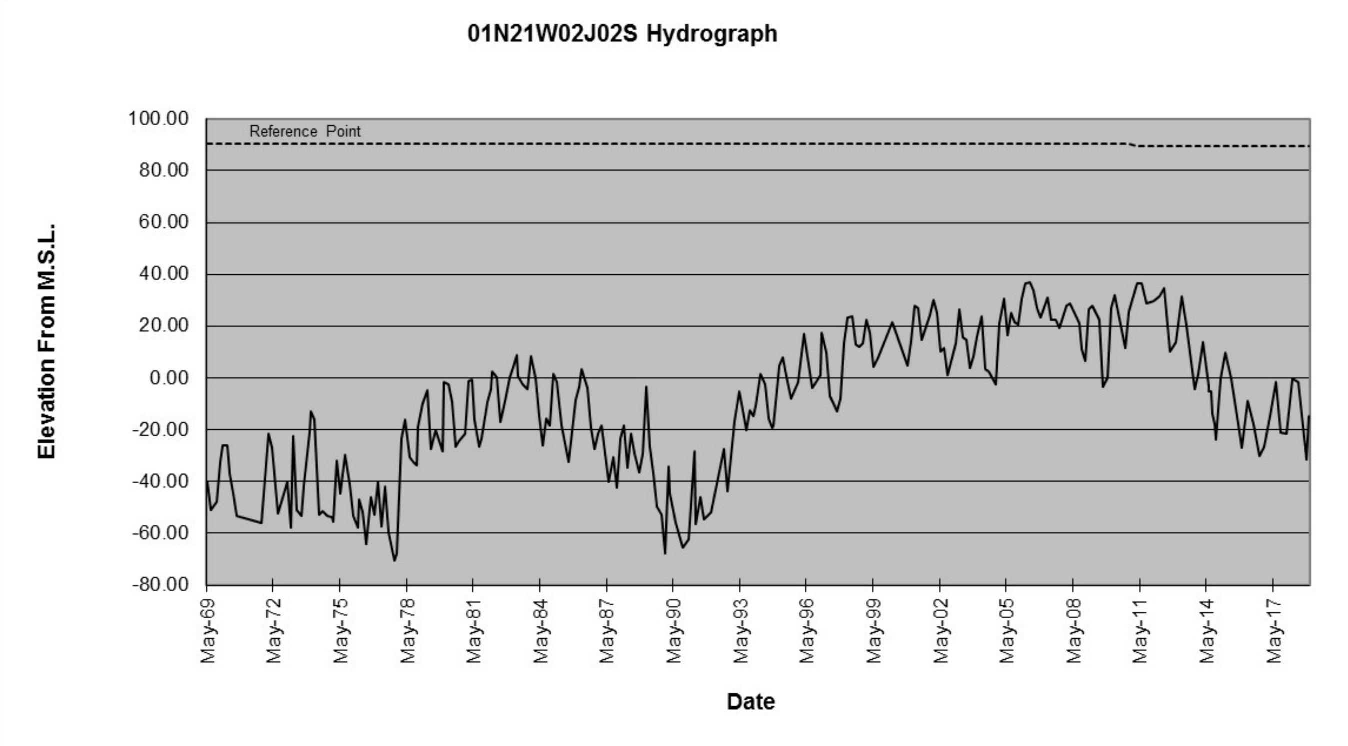


Figure 5-3: Hydrograph for SWN 01N21W02J02S, located in the Pleasant Valley Basin.

5.2 Spring Groundwater Elevation Changes in Key Wells

Locations of each key well are shown in **Figure 5-4**. Key water level changes for the largest groundwater basins are summarized in **Table 5-1**. Spring season measurements are used for comparison since this period is typically at the end of the seasonal rainfall year when groundwater basins are typically most full. The measurements in Table 5-1 are static water level measurements obtained after a water pump has been off for a minimum of 24 hours prior to gauging. In general, groundwater levels show a downward trend due to exceptional drought conditions and increased reliance on groundwater.

Hydrographs (line graphs) of individual key wells are presented in **Appendix B**. Hydrographs show changes in groundwater levels (WLs) measured in relation to the ground surface or a specific reference point (RP) elevation in feet mean see level (msl), typically the magnetic north top of the well casing or the concrete slab at the wellhead. The hydrographs are accompanied by up/down bar graphs to track changes from the previous Spring.

Figure 5-4: Key water level wells in Ventura County.

Table 5-1: Key water level changes for 2018.

DEPTH TO GROUND WATER LEVEL CHANGES AT KEY WELLS IN VENTURA COUNTY							
		HISTORIC					
Groundwater Basin	**WELL NUMBER**	**RECORD HIGH (ft.)**	**RECORD LOW (ft.)**	**LEVEL (ft.)**	**LEVEL (ft.)**	**LEVEL (ft.)**	**CHANGE FROM PREVIOUS YEAR (ft.)**
	(Period of RECORD)	**(DATE)**	**(DATE)**	**(YEAR 2016)**	**(YEAR 2017)**	**(YEAR 2018)**	**(UP/DOWN)**
Oxnard Plain							
Oxnard Aquifer	01N21W07H01S	3.4	88.4	57.6	55.9	57.0	DOWN 1.1
	(Jan.1931-present)	(3/1999)	(9/1964)	(3/24)	(3/16)	(3/20)	
Fox Canyon Aquifer	01N21W32K01S	18	129	89.0	64.1	87.0	DOWN 22.9
	(Dec. 1972-present)	(4/1983)	(12/1990)	(3/14)	(3/13)	(3/12)	
Oxnard Plain Forebay (Measured By UWCD)	02N22W12R04S	16.2 ft.	Dry	Dry	117.14	Dry	DOWN 7.9
	(Mar 1996-present)	(5/2006)	(7/2014 - ?)		(3/28)	(3/28)	
Pleasant Valley Lower System	01N21W03C01S	87.5	253.9	156.5	162.7	162.3	UP 0.4
	(Feb.1973-present)	(8/1995)	(11/1991)	(3/23)	(3/16)	(3/26)	
West Las Posas	02N21W11J04S	368.4	406.2	394.1	404.3	405.7	DOWN 1.4
	(Jan.1991 - Present)	(6/2006)	(9/2016)	(3/3)	(3/9)	(3/7)	
East Las Posas	03N20W26R03S	503	619.3	577.3	570.2	564.0	UP 6.2
	(1985-present)	(4/1986)	(9/2009)	(3/7)	(3/10)	(3/9)	
South Las Posas	02N19W05K01S	22.6	136.2	28.5	29.7	22.6	UP 7.1
	(Jun.1975-present)	(3/2018)	(6/1975)	(3/11)	(3/10)	(3/12)	
Santa Rosa Valley	02N20W26B03S	13.2	60.3	46.7	40.3	66.2	DOWN 25.9
	(Oct.1972-present)	(4/1979)	(11/2004)	(4/4)	(3/23)	(3/27)	
Simi Valley	02N18W10A02S	45	92	76.9	82.1	89.1	DOWN 7.0
	(Dec.1984-present)	(2/1998)	(6/1992)	(3/1)	(3/31)	(3/23)	
Ventura River	04N23W16C04S	3.9	101.9	93.9	34.1	68.9	DOWN 34.8
	(July 1949-present)	(3/1983)	(12/2016)	(3/1)	(3/6)	(3/5)	
Ojai Valley	04N22W05L08S	38.2	312	255.1	234.1	203.1	UP 31.0
	(Oct.1949 - Present)	(4/1978)	(9/1951)	(3/9)	(3/8)	(3/1)	
Mound (Measured by UWCD)	02N22W07M02S	126.6	176.2	161.9	168.04	166.1	UP 1.9
	(Apr.1996-present)	(4/1998)	(4/1996)	(3/24)	(3/21)	(3/15)	
Santa Paula	02N22W02C01S	20.7	51.9	50	49.2	52.7	DOWN 3.5
	(Oct.1972-present)	(4/1983)	(12/1991)	(3/22)	(3/15)	(3/19)	
Fillmore	03N20W05D01S	107.8	163.7	148	143.2	143.5	DOWN 0.3
	(Oct.1972 - Present)	(2/1979)	(1219/77)	(3/21)	(3/15)	(3/19)	
Piru	04N19W25C02S	43.1	183.2	127.25	122.8	100.1	UP 22.7
	(Sep.1961-present)	(3/1993)	(10/1965)	(3/21)	(3/15)	(3/19)	
Lockwood Valley	08N21W33R03S	17.5 ft.	53.5 ft.	46.7	50	53.8	DOWN 3.8
	(April1966-present)	(9/1998)	(4/1974)	(4/13)	(3/29)	(4/4)	
Cuyama Valley	07N23W16R01S	15.0	47.5	57.7	44.1	43.8	UP 0.3
	(Mar.1972-present)	(4/1993)	(9/1990)	(4/13)	(3/29)	(4/4)	

Data prepared: 4/17/2019

The following summary is based on information gathered from key wells as shown in **Table 5-1**.

The Forebay Management Area of the Oxnard Subbasin responds quickly to seasonal and annual changes in precipitation and recharge. The Forebay Area key well (UWCD monitoring well) was dry for the Spring 2018 measurement which was down 7.9 feet from the Spring 2017.

The water level in the Oxnard Subbasin, Oxnard Aquifer, key well was down 1.1 feet from Spring 2017. The water level in the Oxnard Subbasin, Fox Canyon Aquifer, key well was down 22.9 feet from the Spring 2017.

In the Pleasant Valley LAS, the water level in the key well was up 0.4 feet from Spring 2017.

In the Las Posas Valley Basin, the EMA key well water level was up 6.2 feet from Spring 2017. The water level in the EMA key well was up 7.1 feet in Spring 2018. Since 1975, the depth to water in this well has risen from 136 bgs to as high as 22 feet bgs. This trend is attributed to groundwater recharge by effluent from upstream wastewater treatment plant discharges and groundwater discharge to surface from the Simi Valley Basin. The key well for the WMA was down 1.4 feet from Spring 2017.

In the Arroyo Santa Rosa Valley Basin, the water level was down 25.9 feet from Spring 2017. The water level in the Simi Valley Basin key well was down 7.0 feet from Spring 2017. Fluctuations in depth to water in the Simi Valley Basin key well over the past ten years have been minor (<±10 feet).

In the northern portion of the Upper Ventura River Subbasin, the water level in key well 04N23W16C04S was down 34.8 feet from Spring 2017. In the Ojai Valley Basin, the water level in key well 04N22W05L08S was up 31.0 feet from Spring 2017. The Ojai Valley Basin responds quickly to rainfall fluctuations, and it is not uncommon to see large drops in water levels during dry periods and recovery during wet periods (see Hydrograph in **Appendix B**).

The subbasins that underlie the Santa Clara River Valley also respond quickly to fluctuations in annual rainfall. The water level elevation in the Piru Subbasin key well was up 22.7 feet from Spring 2017. The water level in the Fillmore Subbasin key well was down 0.3 feet after being up 4.9 feet the previous spring, and in the Santa Paula Subbasin the water level in the key well was down 3.5 feet from Spring 2017. In the Mound Subbasin the water level in key well 02N22W07M02S was up 1.9 feet from Spring 2017.

The Lockwood Valley Basin key well 08N21W33R03S was down 3.8 feet from Spring 2017. The water level in the Cuyama Valley Basin key well 07N23W16R01S was up 0.3 feet from 2017.

5.3 Potentiometric Surface Maps

Potentiometric surface maps (groundwater elevation maps) are used to visually represent groundwater elevations in specific geographic areas. Groundwater elevation data is taken for Spring and Fall periods from County-gauged wells and wells measured by other organizations/agencies. Generalized potentiometric surface maps created from 2018 groundwater elevation data include the Santa Clara River Valley, the UAS of the Oxnard Subbasin and Pleasant Valley Basin, and the LAS of the Oxnard Subbasin, Pleasant Valley and Las Posas Valley Basins.

Figures 5-5 and 5-6 depict the Santa Clara River Valley that encompasses the Mound, Santa Paula, Fillmore and Piru Subbasins. The Basin area was truncated to include the alluvial area of the valley instead of the full groundwater basin boundaries.

Figures 5-7 and 5-8 depict the UAS of the Oxnard Subbasin and Pleasant Valley Basin.

The UAS is not typically present in the Pleasant Valley area. There are areas of shallow alluvial sediments similar to Oxnard and Mugu aquifer units from which groundwater is extracted. Data from the perched or semi-perched zone of the Oxnard Subbasin was not used as some water levels represent confined conditions.

Figures 5-9 and 5-10 depict the LAS of the Oxnard Subbasin, Pleasant Valley and Las Posas Valley Basins. The Moorpark anticline was used in previous Annual Reports as a boundary between the East and South Las Posas Basins. DWR Bulletin 118 does not divide the Las Posas Basin but there are indications of the presence of a significant groundwater flow barrier (fault) in that location. The potentiometric surface is mapped to reflect a “no-flow” barrier between the East Las Posas and the South Las Posas Basins. Data from wells perforated in the shallow sand and gravel zones of the Las Posas Valley were not used to generate these contours.

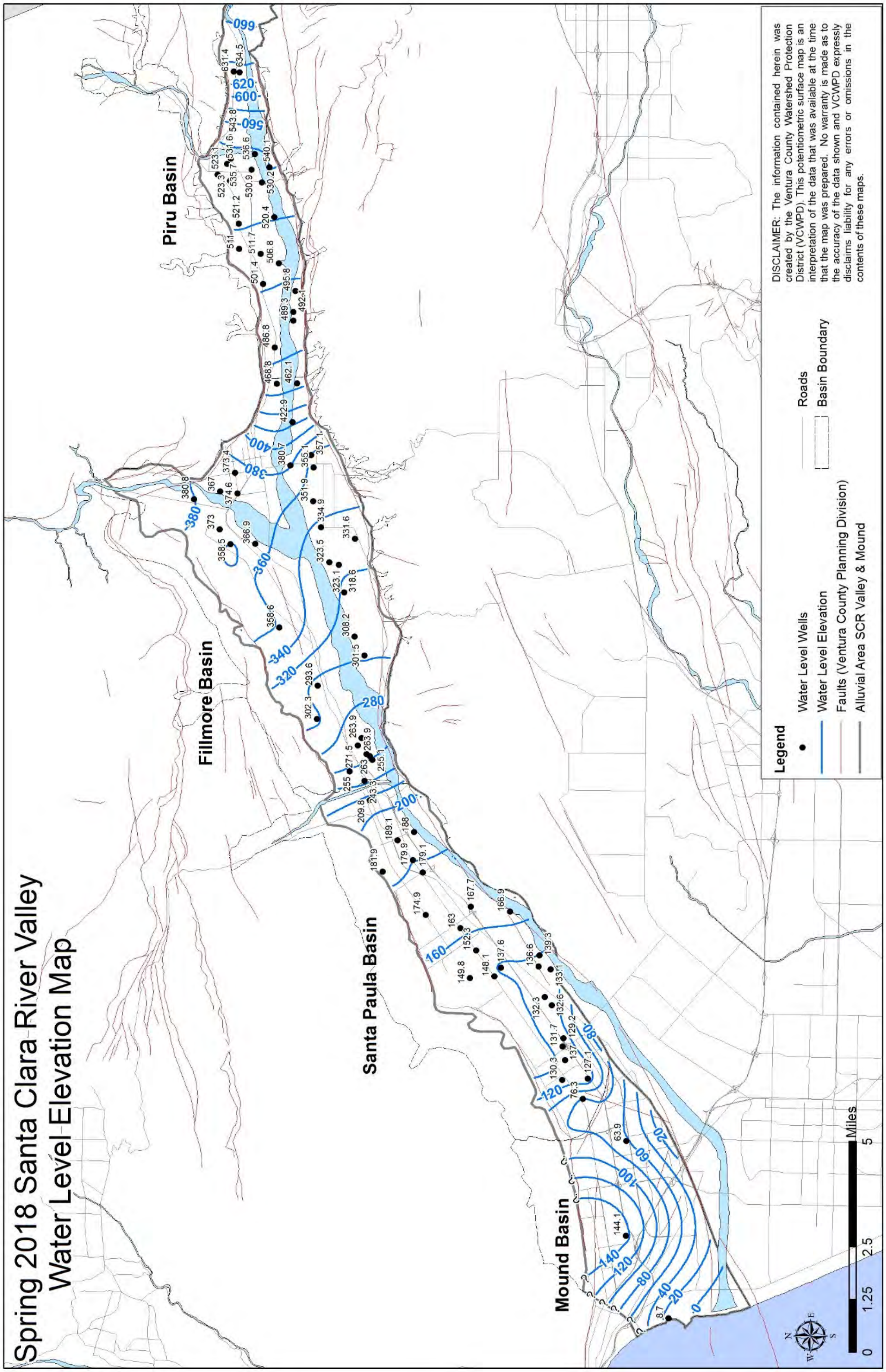


Figure 5-5: Water level surface elevation contours for the Santa Clara River Valley for Spring 2018.

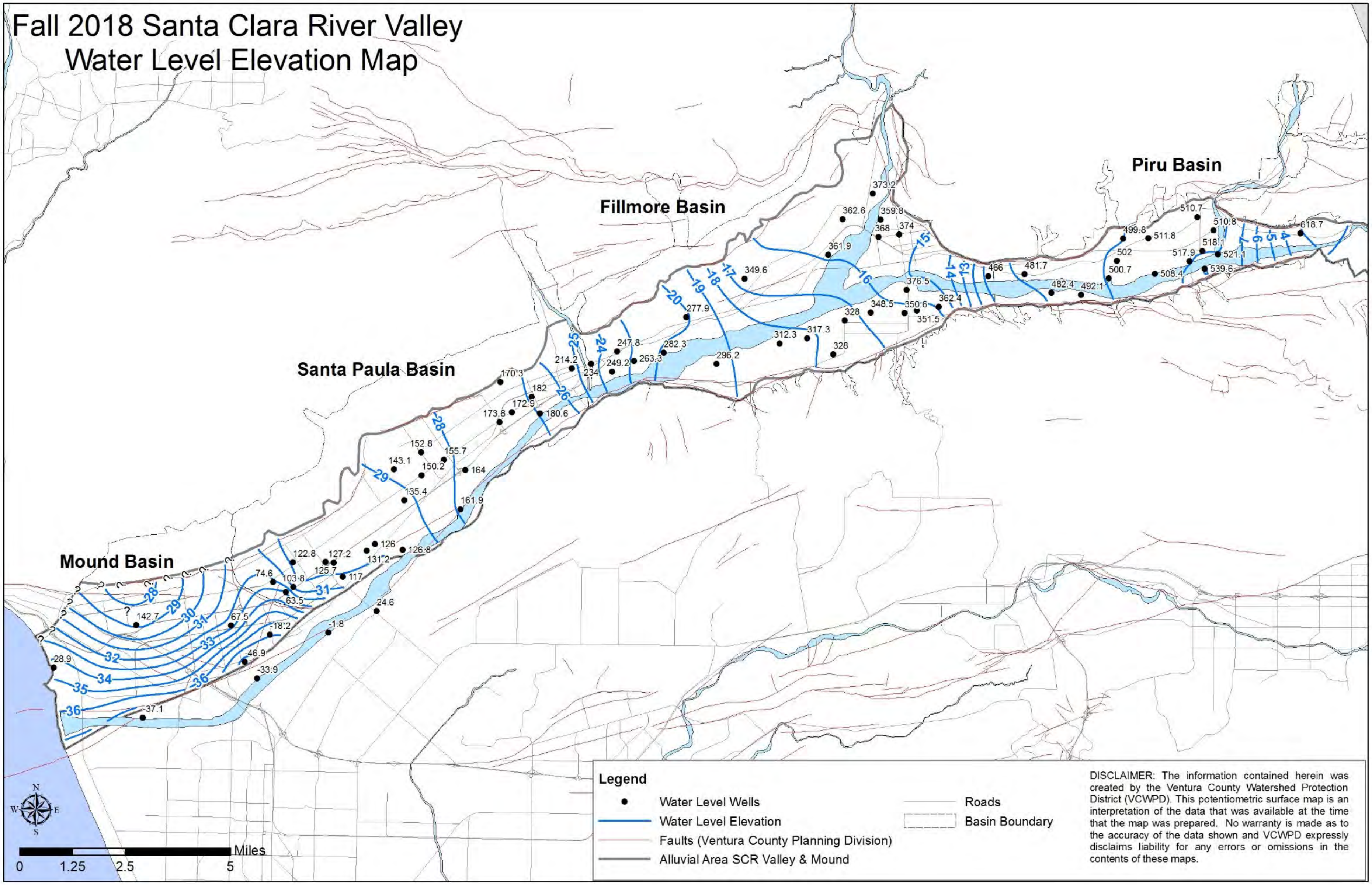


Figure 5-6: Water level surface elevation contours for the Santa Clara River Valley for Fall 2018.

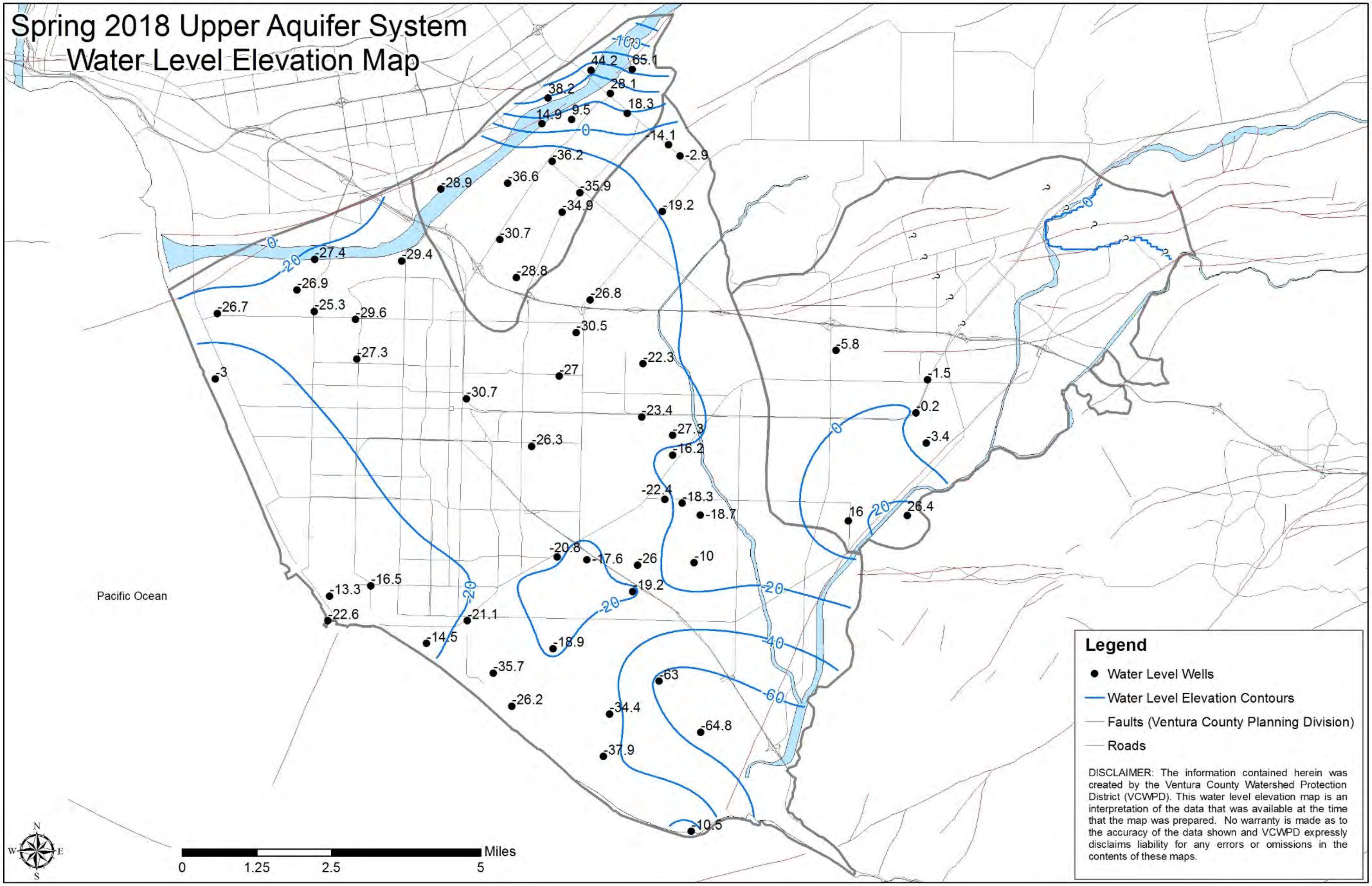


Figure 5-7: Water level surface elevation contours for the Upper Aquifer System for Spring 2018.

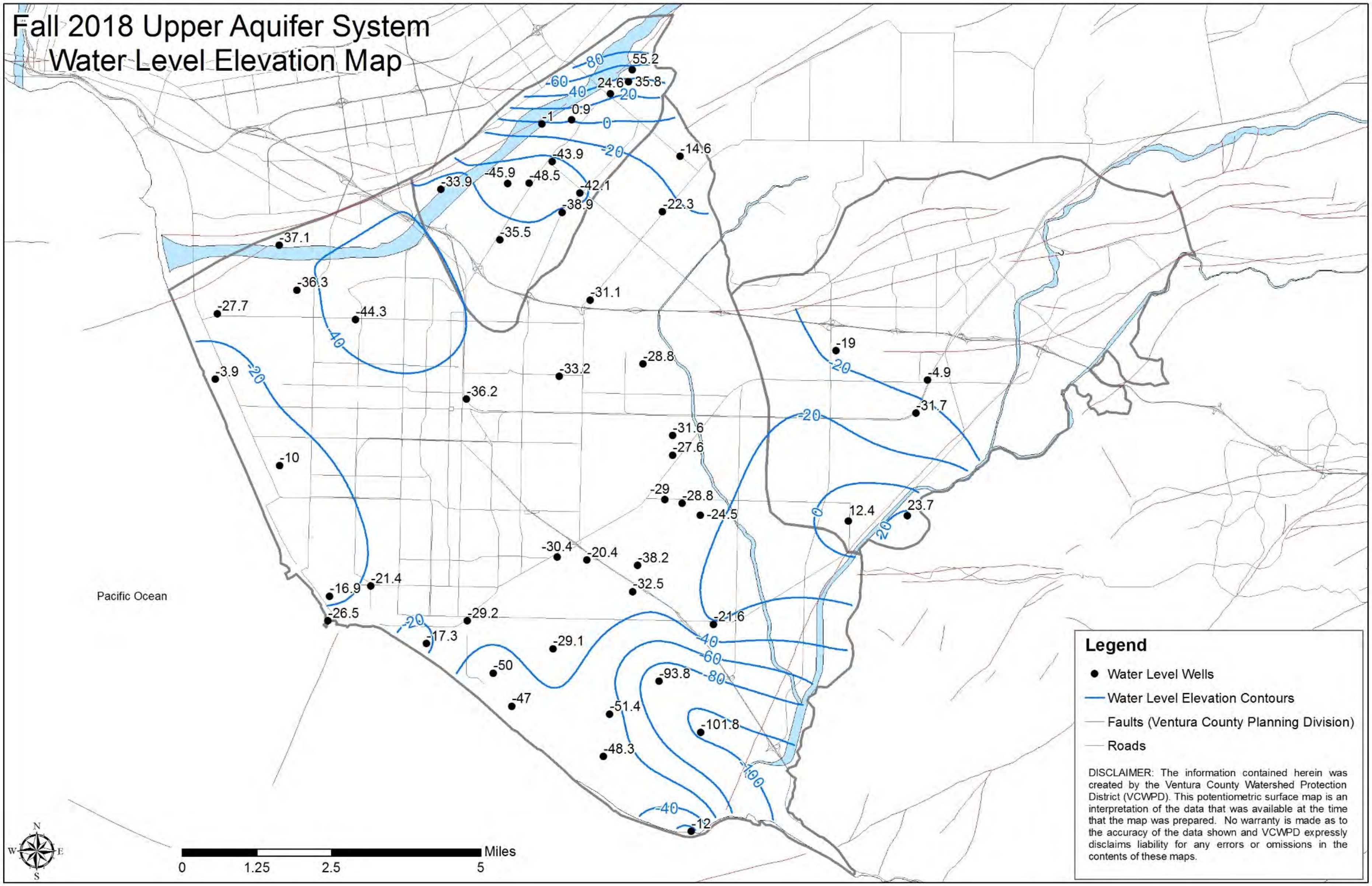


Figure 5-8: Water level surface elevation contours for the Upper Aquifer System for Fall 2018.

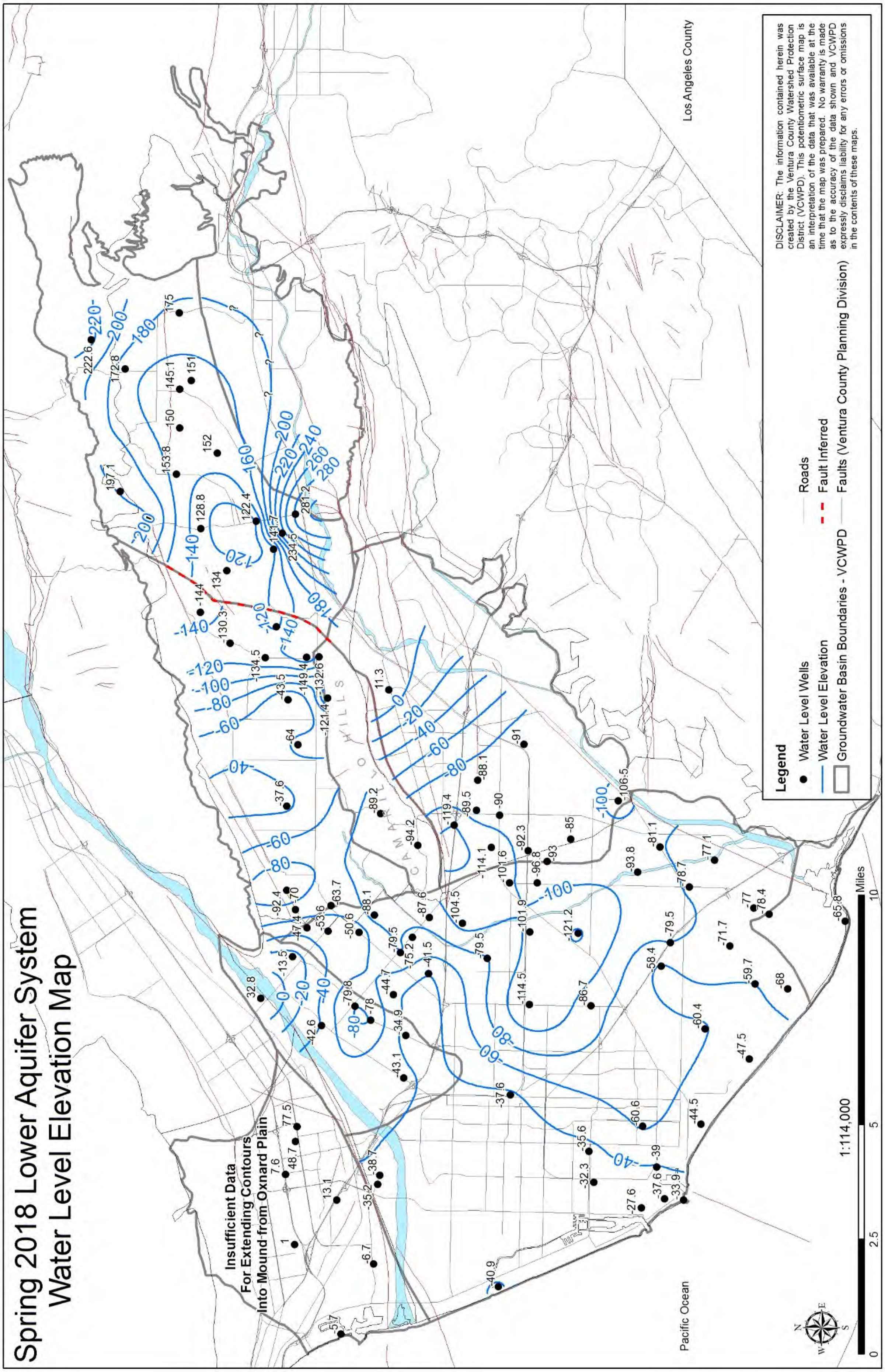


Figure 5-9: Water level surface elevation contours for the Lower Aquifer System for Spring 2018.

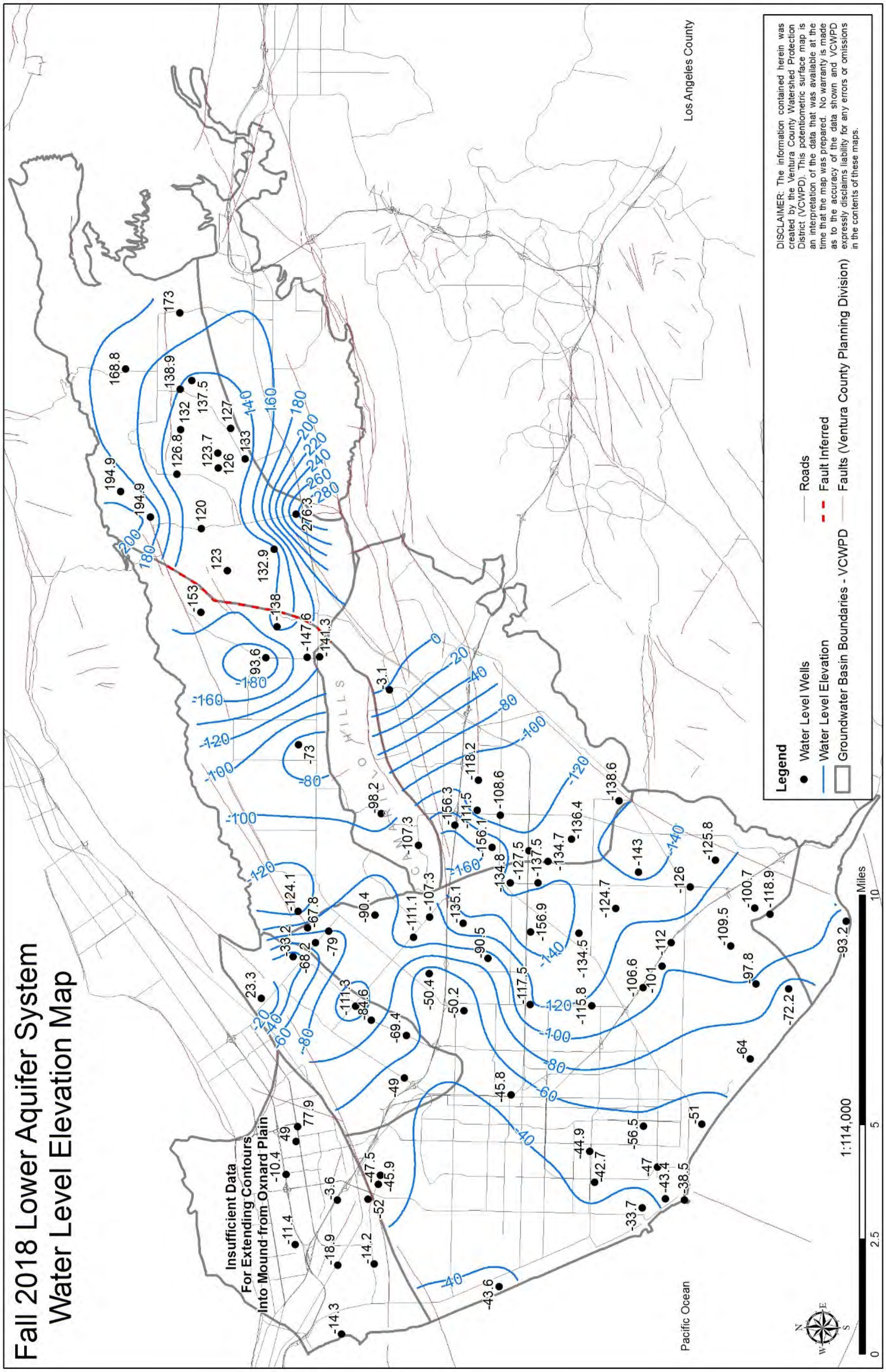


Figure 5-10: Water level surface elevation contours for the Lower Aquifer System for Fall 2018.

5.4 California Statewide Elevation Monitoring Program (CASGEM)

The CASGEM Program was developed by the DWR in response to the passing of Senate Bill X7 6 and Assembly Bill 1152 in November 2009. The law directs that groundwater elevations in all basins and subbasins in California be regularly and systematically monitored, preferably by local entities, with the goal of demonstrating seasonal and long-term trends in groundwater elevations. Resulting information is available from the DWR. The CASGEM program established a permanent, locally managed system to monitor groundwater elevation in California's alluvial groundwater basins and subbasins identified in DWR Bulletin No. 118. The CASGEM program relies and builds on locally established, long-term groundwater monitoring and management programs.

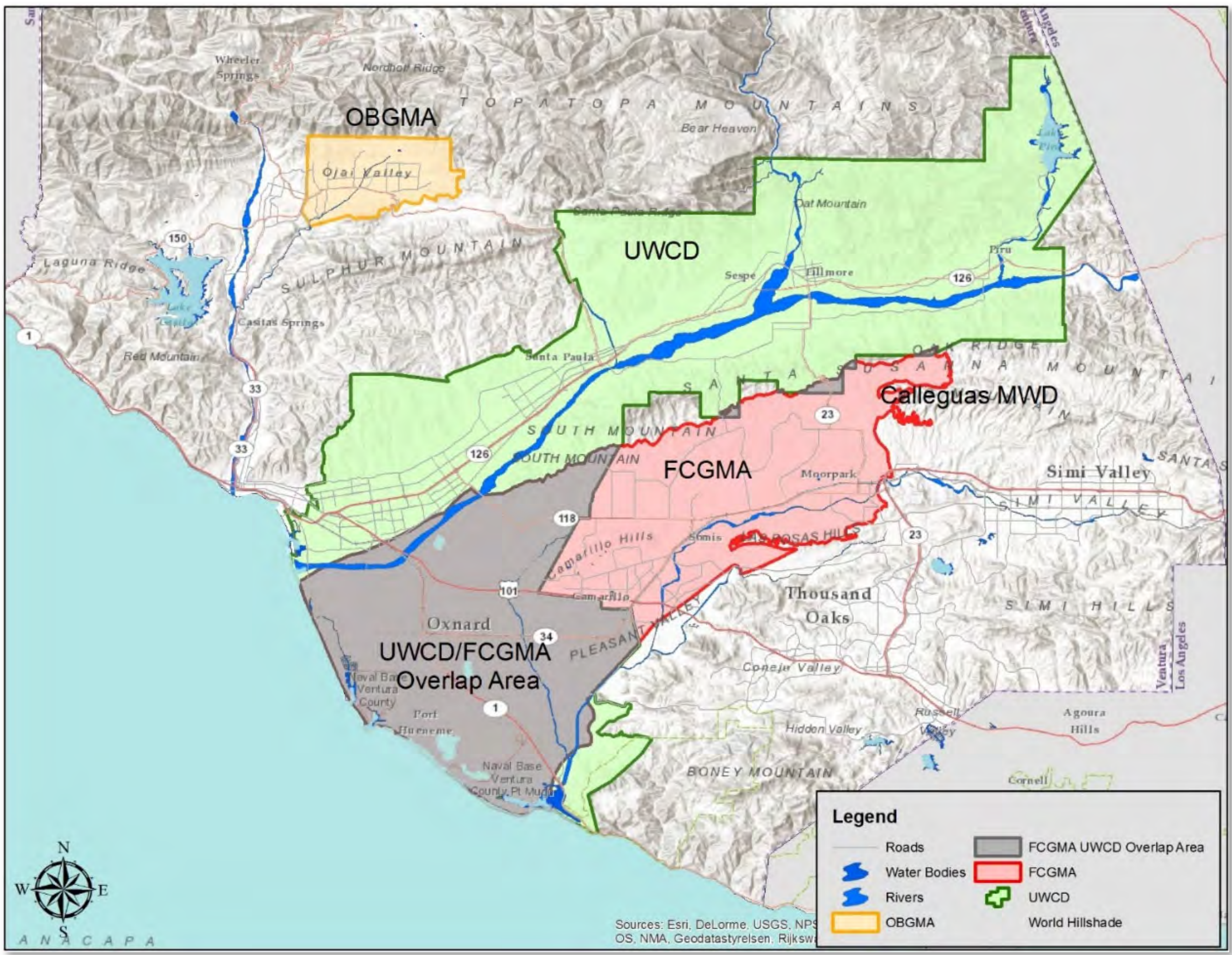
The VCWPD acts as the Umbrella Monitoring Entity for Ventura County by coordinating and reporting groundwater elevation data collected by multiple agencies within a basin. Groundwater level data is collected quarterly or semi-annually, depending on location.

6.0 Water Supplies

6.1 Groundwater Extractions

Three groundwater management agencies (GMAs) in Ventura County oversee groundwater extractions within their jurisdictional boundaries (**Figure 6-1**) and include the FCGMA, UWCD and OBGMA. Well owners and operators within the boundaries of a GMA are required to report their extractions to the respective agency. Owners of wells located outside of a GMA boundary are not required to report their extractions but are requested to report annual well usage to the County.

The FCGMA reports that approximately 60% of groundwater extracted within the Agency is used for agricultural purposes with the remaining 40% for municipal, industrial, and domestic uses. **Table 6-1** compares extractions reported to the three agencies for the years 2009 through 2018. Owners of wells located in agency boundary overlap areas must report extractions to all agencies.



<u>**Figure 6-1**</u>: Groundwater Management Agencies in Ventura County.

Table 6-1: Agency-reported extractions 2009 through 2018[9,10]

	Agency		
Reported Extractions (AF)	UWCD	FCGMA	OBGMA
2009-1	82,505.37	63,328.20	2,553.48
2009-2	104,049.64	82,163.55	2,871.94
Annual Total 2009	**186,555.01**	**145,491.75**	**5,425.42**
2010-1	69,541.85	54,188.64	2,004.86
2010-2	89,558.90	69,827.92	3,001.11
Annual Total 2010	**159,100.75**	**124,016.56**	**5,005.97**
2011-1	72,940.07	54,357.81	2,050.00
2011-2	86,560.99	65,877.62	3,099.00
Annual Total 2011	**159,501.06**	**120,235.43**	**5,149.00**
2012-1	78,716.61	59,904.02	2,845.56
2012-2	99,285.26	75,327.91	2,559.40
Annual Total 2012	**178,001.87**	**135,231.94**	**5,404.96**
2013-1	87,336.86	64,751.13	2,805.76
2013-2	116,708.94	88,957.84	2663.216
Annual Total 2013	**204,045.80**	**153,708.97**	**5,468.97**
2014-1	101,577.29	85,233.43	2,232.15
2014-2	101,468.80	65,731.43	2,144.20
Annual Total 2014	**203,046.09**	**150,964.86**	**4,376.35**
2015-1	85,905.46	71,411.15	1,817.92
2015-2	107,590.82	70,810.82	1,901.51
Annual Total 2015*	**193,496.28**	**142,221.97**	**3,719.43**
2016-1	82,315.09	69,823.38	1,461.22
2016-2	100,801.24	64,323.08	1,424.93
Annual Total 2016*	**183,116.33**	**134,146.46**	**2,886.15**
2017-1*	69,854.68	58,467.95	1,659.09
2017-2*	113,402.30	72,062.56	2,855.32
Annual Total 2017*	**183,256.98**	**130,530.51**	**4,514.41**
2018-1	75,041.90	63,094.51	
2018-2	94,195.78	60,325.28	
Annual Total 2018**	**169,237.68**	**123,419.79**	**4,158.49**
UWCD as 07/19/2019		FCGMA as of 08/22/2019	

*Reflects revised values for all agencies.
**Values are subject to change. *FCGMA as of 04/05/2018, UWCD as 04/11/2018.*
***Preliminary - Values do not reflect full reporting.

[9] Data courtesy of FCGMA.
[10] Data courtesy of OBGMA.

6.2 Wholesale Districts

Surface and imported water are supplied by three wholesale water districts including UWCD, Casitas Municipal Water District (CMWD) and Calleguas Municipal Water District (Calleguas) (**Figure 6-2**)

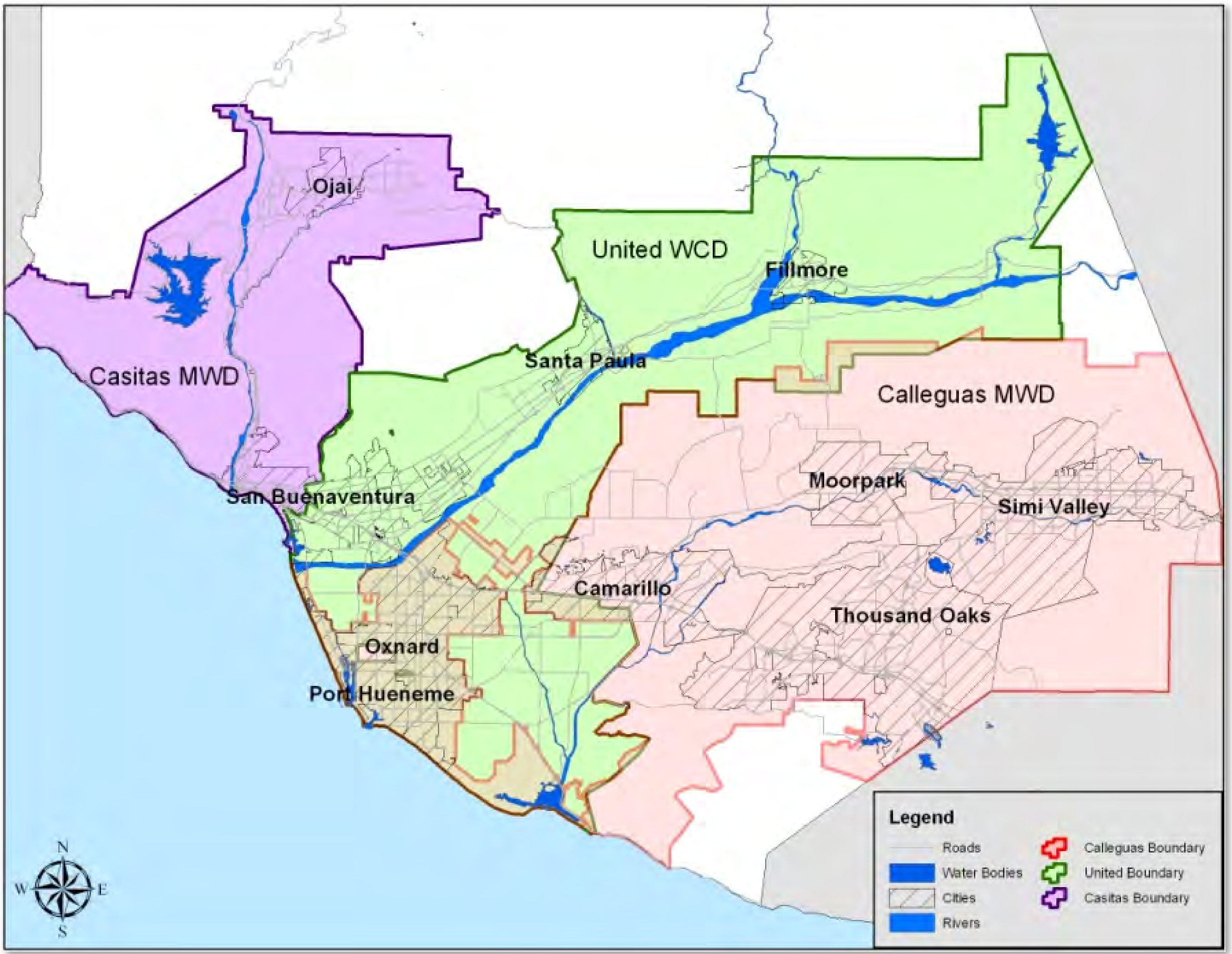


Figure 6-2: Wholesale water district boundary map.

Calleguas delivers the largest volume of water to retailers. Approximately 75% of the population in the County receives a mix of imported State Water Project (SWP) water and Colorado River water from Calleguas. Water from the SWP comes from Northern California via a water system owned and operated by the Metropolitan Water District (MWD) of Southern California, a regional wholesaler that supplies SWP water to Calleguas. Calleguas imported a total of 93,071.5 AF of treated water in 2018. Calleguas delivered 91.340.20 AF of water to retailers in 2018 compared to 89,666 AF in 2017 and 84,196 AF in 2016. Production from the Calleguas Aquifer Storage and Recovery (ASR) wellfield was 2,761.13 AF in 2018. Imported water is also injected in the East Las Posas Management Area through the Las Posas ASR Project. In the ASR wellfield 5,084.28 AF of water was injected in 2018. Up to 11,000 AF of water can be stored by Calleguas in Lake Bard and supply demand for short periods of time. The end of year water volume in storage in Lake Bard was 10,150 AF[11]. The Las Posas Basin ASR wellfield currently has 18

[11] Data provided courtesy of Calleguas MWD.

wells, operated by Calleguas. The wells are 800 to 1,200 feet deep and perforated in the Fox Canyon Aquifer (Calleguas 2007).

UWCD delivered 16,953 AF of water to retailers and end-users in 2018, up slightly from 16,613 AF in 2017. UWCD can store up to 87,000 AF of water in Lake Piru. At the end of 2018 there was 11,776 AF of stored water in Lake Piru. UWCD released 6,430 *(preliminary data)* AF of water from the lake in 2018. UWCD imported 1,103 AF of SWP water into Ventura County from Pyramid Lake in 2018. Water released from Lake Piru flows down Piru Creek to the Santa Clara River where it is ultimately diverted downstream at the Freeman Diversion Dam. UWCD operates spreading basins in the Oxnard Subbasin for the purpose of groundwater recharge. Some of the water diverted from the Santa Clara River at the Freeman Diversion is sent to the Saticoy and El Rio spreading basins with the remainder sent through the Pleasant Valley Pipeline (PVP) and the Pumping Trough Pipeline (PTP). **Table 6-2** and **Figure 6-4** compare the volume of water diverted and sent to spreading grounds by UWCD[12]. Annual precipitation for the period of 2004 to 2018 is also shown. Recharge to basins is a function of SWP deliveries and restrictions from other agencies.

Table 6-2: Precipitation versus UWCD recharge water volume by Calendar Year.

CY Year	Precipitation El Rio Spreading Grounds Gage 239(in.)	Saticoy Recharge (AF)	El Rio Recharge (AF)	Noble Pit (AF)
2004	16.13	8,105.00	15,061.00	0.00
2005	24.43	46,872.00	52,267.00	19,490.00
2006	15.29	29,005.00	40,840.00	10,709.00
2007	7.77	11,404.00	18,200.00	99.00
2008	14.07	28,631.00	19,631.00	8,562.00
2009	10.86	9,215.00	13,223.00	0.00
2010	22.07	15,108	30,125.00	995.00
2011	10.95	23,435.00	37,845.00	10,679.00
2012	8.79	3,985.00	16,293.00	538.00
2013	2.97	34.00	2,389.00	263
2014	9.50	387.00	1,935.00	578
2015	5.09	1,231.00	1,285.00	0.00
2016	10.00	1,784.20	806.00	59.00
2017	15.22	3,100.00	6,043.00	1,036
2018	9.52	2,301.00	1,205.00	212.00

[12] Data provided courtesy of UWCD is preliminary and subject to change per UWCD. Freeman Diversion data from UWCD operations logs.

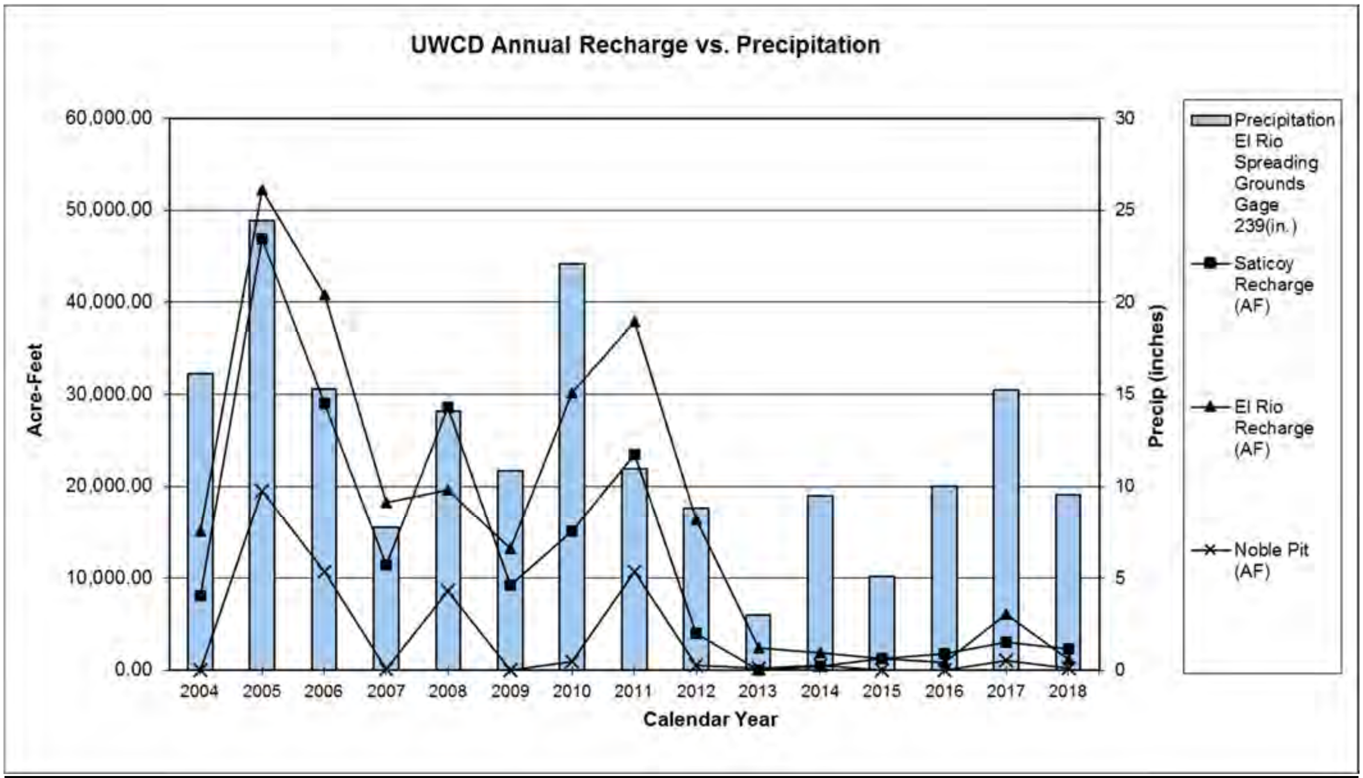


Figure 6-3: Precipitation versus UWCD recharge.

CMWD delivered approximately 12,168 AF in 2018, with 3,590 AF sold to retail water purveyors. The district provides water to residential and agricultural customers, and some of the 23 water purveyors located within the district's boundaries. Annual water deliveries can vary from 13,000 to 23,000 AF. CMWD provides a blend of groundwater and surface water to its customers. Surface water is stored in Lake Casitas which has an overall capacity of 238,000 AF. At the end of 2018, 72,352 AF of water was stored in the lake. Water from the Ventura River is diverted at the Robles Diversion facility. The facility diverts high flows from rainstorms and operates on average only 53 days per year. CMWD diverts, on average 31% of the Ventura River flow, with 10% of that volume being redirected downstream through the Robles Diversion Fish Passage for the endangered steelhead trout and to enhance recovery of the Ventura River habitat[13].

[13] Data provided courtesy of Casitas MWD.

Table 6-3: Comparison of wholesale district water deliveries 2009-2018.

	Total Water Deliveries in Acre Feet (AF)			
Year	**CMWD**	**Calleguas**	**UWCD**	**Annual Total**
2009	15,736	108,726	41,478	165,940
2010	13,497	94,864	34,076	142,437
2011	13,439	97,218	31,868	142,525
2012	15,268	104,104	32,638	152,010
2013	18,270	111,283	24,358	153,911
2014	18,336	106,293	17,492	142,121
2015	16,272	89,045	16,293	121,609
2016	12,793	87,542	16,757	117,092
2017	12,166	89,666	16,613	118,445
2018	12,168	91,340	16,953	120,461
Period Total	**147,946**	**888,741**	**248,525**	**1,256,092**

6.3 Surface Water

Surface water resources can be hydrologically linked to groundwater resources. The connection between surface water and groundwater is understood by natural recharge of aquifers from surface water (losing streams), and discharge of groundwater to surface water (gaining streams). Surface water diversions allow for use of surface water instead of extracted groundwater. Surface water is used to artificially recharge groundwater.

Figure 6-4 shows the volume of stored surface water and diverted surface water. In 2018, UWCD released approximately 6,430 AF of water from Lake Piru, including a fish passage requirement of 5 cubic feet per second (cfs) per day. UWCD diverted 3,735 AF from the Santa Clara River at the Freeman Diversion Dam with 2,301 AF sent to the Saticoy Spreading Grounds, 1,205 AF sent to the El Rio Spreading Grounds and 212 AF sent to the Noble Pit, with some surface water also going to agricultural customers through the PTP and the PVP. At the end of 2018 there was 11,776 AF of water in storage in Lake Piru, 72,352 AF in Lake Casitas and 10,150 AF in Lake Bard. CMWD releases 3,200 AF per year from Lake Casitas for the Robles Diversion Fish Passage.

In 2018 in the Oxnard Subbasin, there were reduced diversions of surface water for direct agricultural use and groundwater recharge. The reductions were a funciton of drought conditions and regulatory constraints on releases of from Lake Piru.

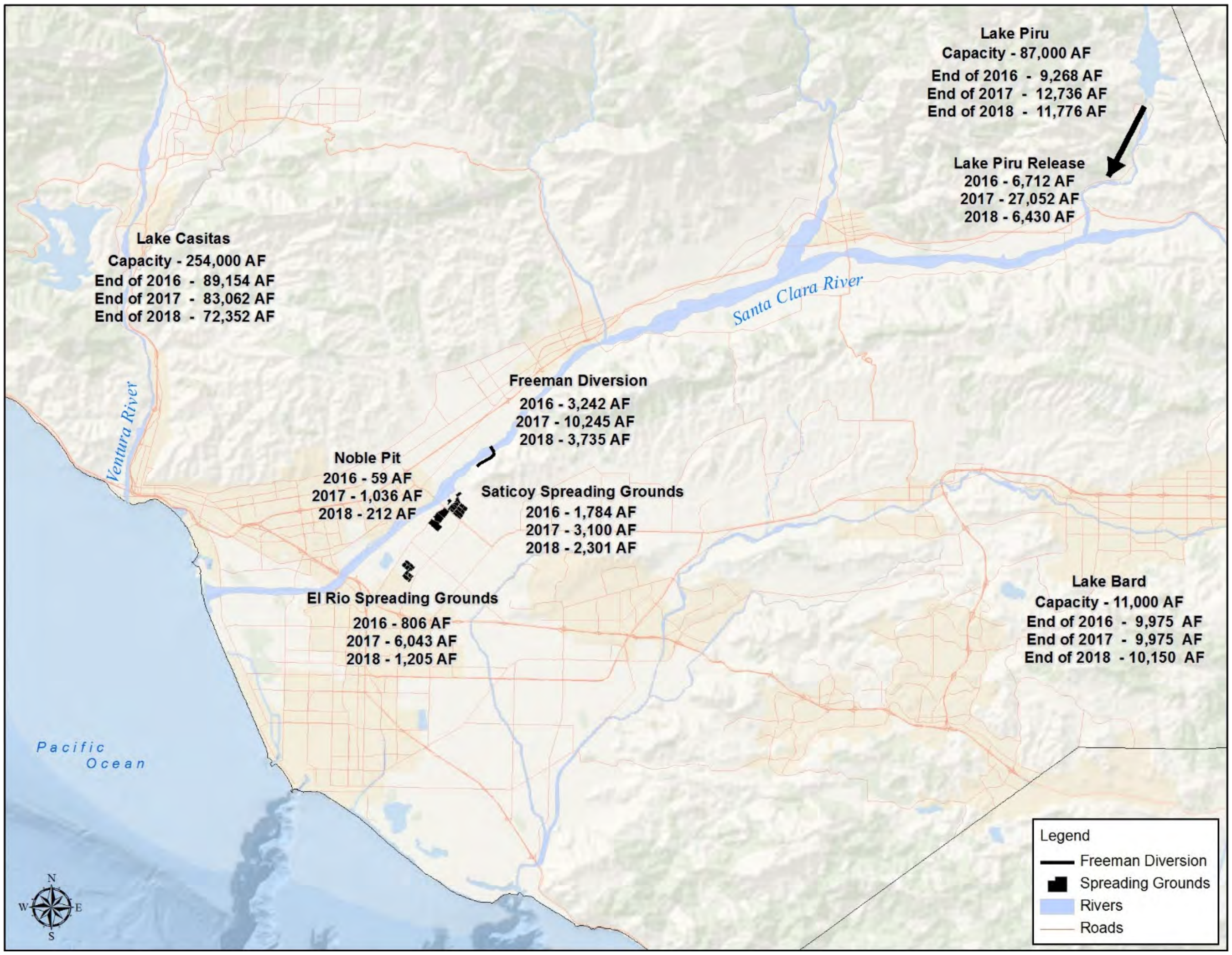


Figure 6-4: Surface water storage and diversion.[11, 12, 13].

6.4 Surface & Imported Water Demands

Of the ten incorporated cities within Ventura County only Santa Paula and Fillmore do not rely on water supplied by the three major wholesale districts.

The cities of Ventura and Oxnard use a blend of imported water, groundwater and treated surface water to meet demands. Ventura receives treated water diverted from the Ventura River, groundwater extracted from City wells and surface water from Lake Casitas delivered by CMWD. Oxnard receives water from UWCD, imported water from Calleguas and groundwater from its own well fields.

The cities of Simi Valley, Moorpark and Thousand Oaks as well as the unincorporated areas of Bell Canyon, Newbury Park, Hidden Valley, Lake Sherwood, Oak Park, and part of Westlake Village rely mainly on water imported by Calleguas.

Simi Valley residents receive water from Ventura County Water Works District No. 8 (VCWWD8). VCWWD8 extracts groundwater from three wells in the Tapo Canyon. Shallow groundwater is also extracted from several dewatering wells at the west end of the city. The dewatered groundwater is discharged to the Arroyo Simi. The Tapo Canyon Water Treatment Plant (WTP) utilizes the three Tapo Canyon wells to provide water to approximately 500 homes. Golden State Water Company (GSWC) in Simi Valley extracts groundwater from one well and blends it with imported water from Calleguas (10% groundwater, 90% imported water)[14]. VCWWD8 serves 68% of demand or approximately 23,000 AF of water while GSWC serves the remaining 32%, approximately 8,500 AF[15]. In 2018 Calleguas delivered 19,651 AF to VCWWD8 and 5,432 AF to GSWC.

Moorpark residents receive water from Ventura County Water Works District No. 1 (VCWWD1). Approximately 75-80% of VCWWD1's water is imported from Calleguas. In 2018, Calleguas delivered 7,507 AF to VCWWD1. Moorpark also extracts groundwater from two wells used for park irrigation.

The City of Thousand Oaks extracts groundwater for median irrigation on Hillcrest Avenue and golf course irrigation at the Los Robles Golf Course. California Water Service and California American Water along with the City of Thousand Oaks Water Department provide water imported from Calleguas in the Thousand Oaks, Newbury Park and Westlake Village area. According to the City of Thousand Oaks 2015 Urban Water Management Plan (UWMP), the City supplies water to approximately 36% of water users, California American Water supplies 48% and California Water Service Company supplies 16%. In 2018, these three water purveyors received 32,170 AF of water from Calleguas.

The City of Camarillo relies on groundwater and imported water from Calleguas. The city extracts groundwater from four wells, supplying approximately 40-50% of the city's water demand with the remaining demand supplied by imported water. Groundwater extraction volume is kept below the groundwater extraction allocation from FCGMA. In 2018, Calleguas delivered 4,624 AF of water to the City of Camarillo. Water for some residents is supplied by Pleasant Valley Mutual (groundwater and imported water), Crestview Mutual (groundwater and imported water), California American Water Co. (imported water), and Camrosa Water District (groundwater and imported water).

The Port Hueneme Water Agency (PHWA) receives and treats UWCD water and blends it with water from Calleguas for the City of Port Hueneme, Channel Islands Beach Services Community District (CIBSC) and Naval Base Ventura County.

The City of Ojai and the communities of Casitas Springs, Meiners Oaks and Oak View rely on a mixture of groundwater extracted by local purveyors and wholesale water from Lake Casitas delivered by the CMWD.

[14] Golden State Water Company, 2015 Urban Water Management Plan – Simi Valley.

[15] Ventura County Waterworks District No. 8, City of Simi Valley, 2015 Urban Water Management Plan.

The City of Santa Paula relies on local groundwater (approximately 5,000 to 7,000 AFY based on reporting to UWCD). In addition, some surface water is diverted from Santa Paula Creek (approximately 500 AFY)[16] and is sent to Canyon Irrigation Company in exchange for extraction credits for the Santa Paula Basin. The City of Fillmore relies solely on groundwater extracted from City water wells (approximately 2,600 to 2,800 AFY based on reporting to UWCD). The community of Piru relies on groundwater delivered by local water purveyors.

Residents of the Lockwood Valley area, the Santa Monica Mountains area and other areas without water service rely on private water wells. Water is extracted from alluvial groundwater basins or from fractured volcanic rock and bedrock in areas outside of a basin setting.

[16] Data from City of Santa Paula 2015 Urban Water Management Plan

7.0 Sustainable Groundwater Management Act (SGMA)

On January 1, 2015, the Sustainable Groundwater Management Act (SGMA) became effective. SGMA is a comprehensive three-bill package that establishes a new structure for local authorities to sustainably manage their groundwater basins. Sustainable management under the act is defined as the management and use of groundwater in a manner that can be maintained without causing “significant and unreasonable”.

The Act requires the formation of local groundwater sustainability agencies (GSAs) in all DWR Bulletin No. 118 basins designated as high or medium priority and critically-overdrafted. Critically-overdrafted basins must submit a GSP by January 31, 2020; other high and medium priority basins must be managed under a GSP by January 31, 2022.GSAs can form in low-priority basins, but the law does not require it. GSAs must assess conditions in their respective water basins and adopt a groundwater sustainability plan (GSP) that ensures the basin will be sustainably managed within 20 years, with interim milestones subject to state review every five years.

7.1 Critically Overdrafted Basins

SGMA states a basin is subject to critical overdraft “when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts.” Undesirable impacts result from conditions of critical overdraft which include seawater intrusion, land subsidence, groundwater depletion, and/or lowering of groundwater levels. SGMA directed the DWR to identify critically-overdrafted groundwater basins and subbasins. DWR identified a statewide base period from 1989 to 2009 for evaluation that included wet and dry periods. A basin is placed in critical overdraft when the basin has one or more undesirable impacts. DWR compiled a list of 21 critically-overdrafted basins and subbasins in January 2016. Three are in Ventura County (**Figure 7-1**). Those basins are the Cuyama Valley Basin (Bulletin 118 No. 3-013), the Pleasant Valley Basin (Bulletin 118 No. 4-006), and the Oxnard Subbasin (Bulletin 118 No. 4-004.02).

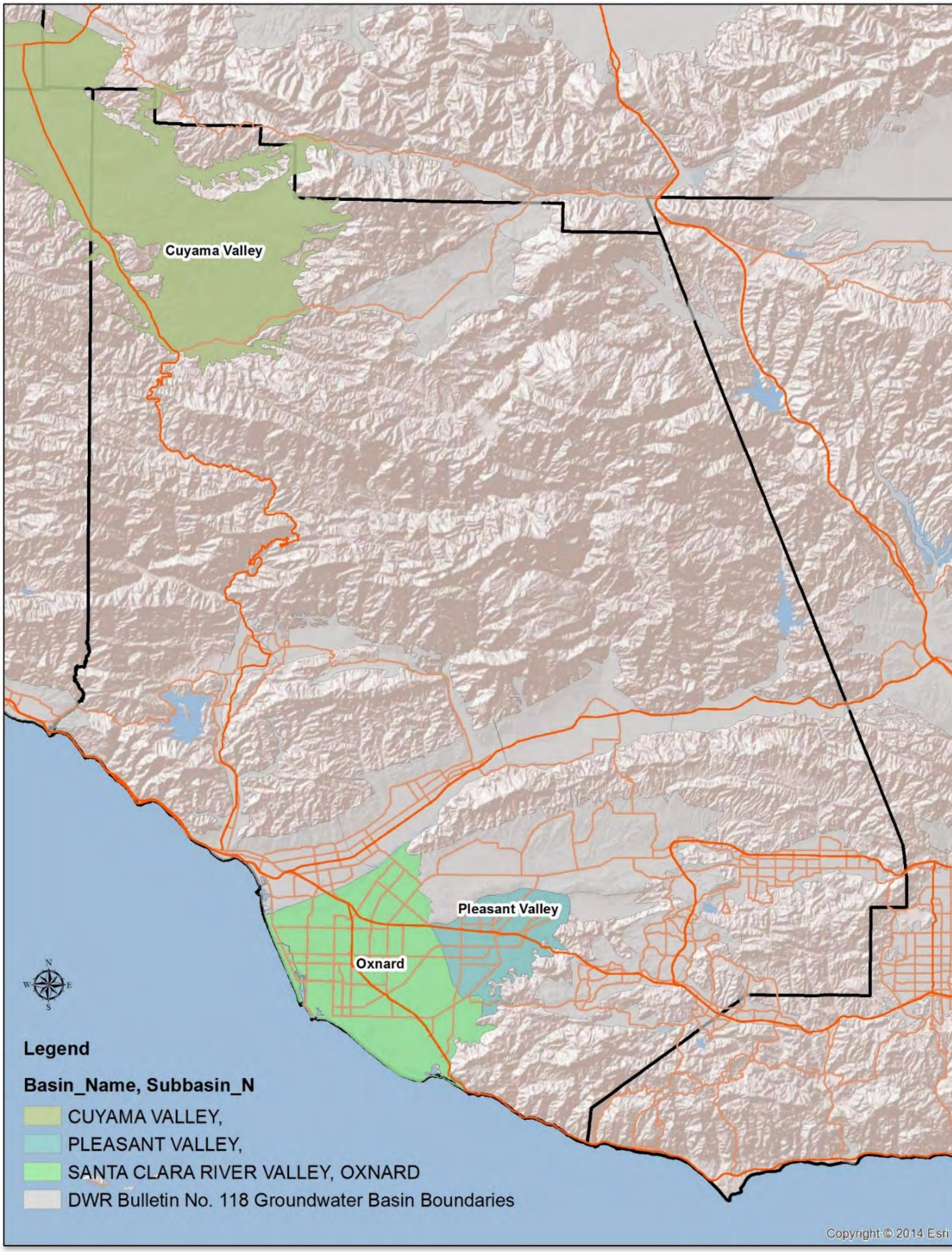


Figure 7-1: Critically-overdrafted basins in Ventura County.

7.2 High & Medium Priority Basins in Ventura County

DWR implemented the CASGEM Program in response to legislation enacted in the California Water Code as part of California's 2009 Comprehensive Water package. The purpose of CASGEM is to establish a permanent, locally managed program of groundwater level monitoring to track seasonal and long-term trends in groundwater elevation. As part of CASGEM, the DWR prioritized California's 517 groundwater basins to identify the need for additional monitoring. The CASGEM basin prioritization is a statewide ranking of the overall importance of groundwater to meet urban and agricultural demands of the overlying population.

As of May 2014, 127 of the 517 basins were ranked as medium and high priority basins. Those 127 medium and high priority basins account for 96% of California's annual groundwater extraction. Ventura County has a total of 4 high priority and 7 medium priority basins shown in **Figure 7-2**.

New priority rankings are expected to be completed by DWR in early 2019.

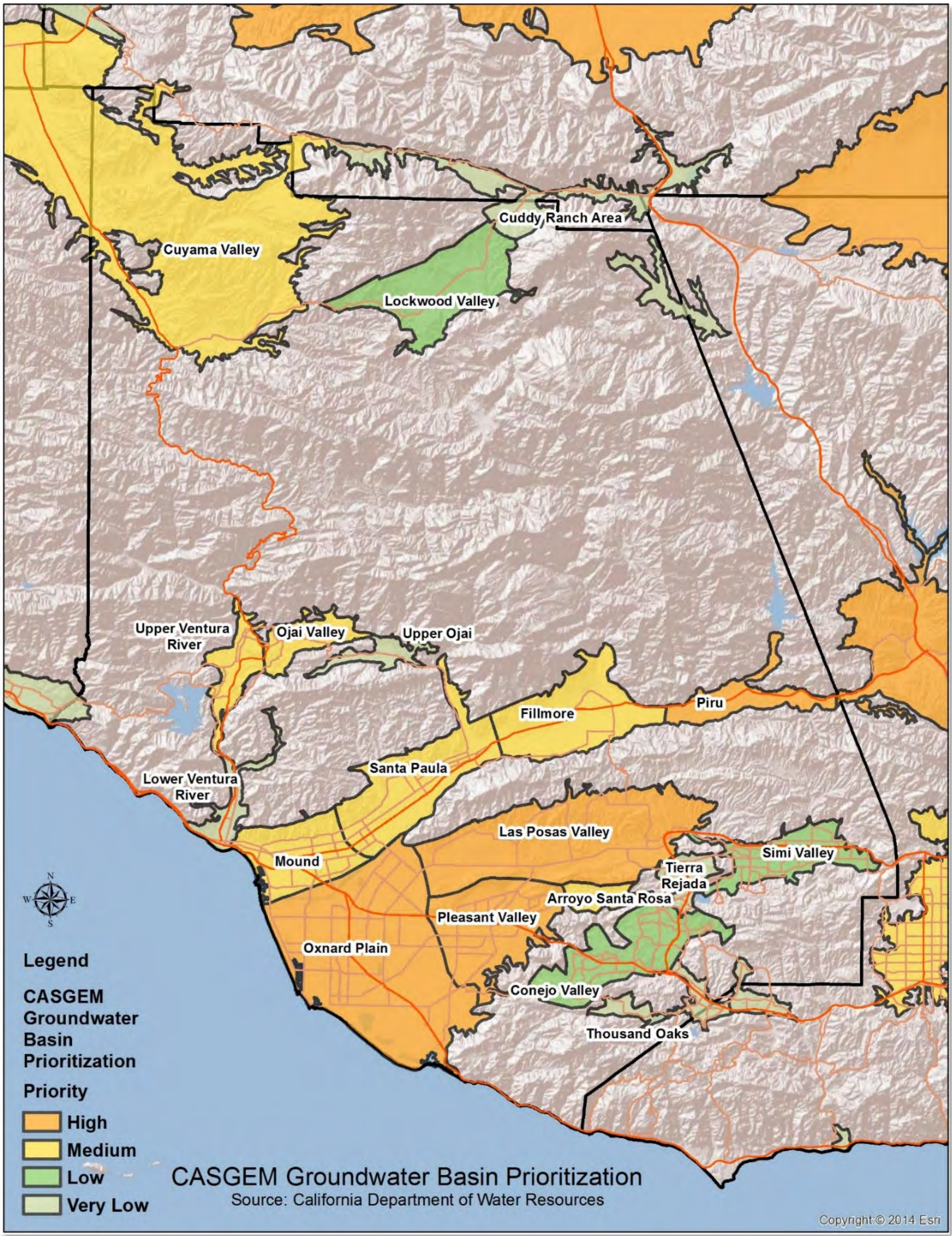


Figure 7-13: 2018 CASGEM basin prioritization in Ventura County.

7.3 Adjudicated Basins

Santa Paula Basin

The Santa Paula Basin (Bulletin 118 Basin No. 4-004.04) is currently the only adjudicated basin in Ventura County. Adjudicated basins do not need a GSA but must still provide groundwater measurements to DWR.

Santa Paula Basin's groundwater rights were adjudicated in 1996 in a stipulated judgement to establish pumping allocations and a management plan for the basin. The judgement awarded 27,500 acre-feet of groundwater rights to the SPBPA to be held in trust for the benefit of its members. Each member is entitled to an "Individual Party Allocation" (IPA) that establishes a maximum quantity of water that can be extracted from the basin. The judgement also includes cut back provisions that can be implemented as necessary to balance total production within the basin's safe yield.

A Watermaster is usually appointed by the court to ensure the basin is managed in accordance with the court's decree. A Technical Advisory Committee (TAC) acts as the Watermaster for the Santa Paula Basin with equal representation from UWCD, the SPBPA and the City of Ventura. The TAC also determines the safe yield of the basin, along with the development and implementation of a basin management plan. Annual reports of the monitoring program are submitted to the TAC for review and approval. The primary groundwater management objective in the Santa Paula Basin is to ensure that production does not exceed the long-term sustainable yield of quality groundwater for current and future uses.

7.4 Groundwater Sustainability Agencies (GSA's)

GSAs are responsible for developing and implementing a GSP to ensure the basin meets is sustainability goal by operating within its sustainable yield without creating undesirable results. Before the DWR will accept and review submitted GSPs, a basin must be managed under a GSA or multiple GSAs. GSAs for all medium- and high-priority basins in Ventura County are formed and with no "unmanaged areas.[17]"

Arroyo Santa Rosa Basin GSA

The County of Ventura and the Camrosa Water District (Camrosa) entered into a Joint Exercise of Powers Agreement (JPA) to manage the portion of the Arroyo Santa Rosa Basin (DWR Basin No. 4-007) outside of the FCGMA boundary. The JPA was approved by the Ventura County Board of Supervisors on October 4, 2016, officially forming the Arroyo Santa Rosa Basin GSA. The western area of the Arroyo Santa Rosa Basin will be managed by the FCGMA and the eastern portion by the Arroyo Santa Rosa Basin GSA.

Camrosa Las Posas Basin GSA

The majority of the Las Posas Basin (DWR Basin No. 4-008) fall under the jurisdiction of the FCGMA. A 4.5-mile section along the southern border is outside of the FCGMA boundaries and will be managed by Camrosa. Camrosa delivers potable and non-potable water to residential and agricultural customers in that area and filed to act as the GSA for that portion of the basin on June 28, 2017.

Camrosa OPV Management Area GSA

Camrosa also filed to act as the GSA for the portions of the Oxnard Subbasin (DWR Basin No. 4-004.02) and the Pleasant Valley Basin (DWR Basin No. 4-006) outside of the FCGMA boundary on June 28, 2017. Camrosa will be the GSA for areas that lie within their service area but are outside of the FCGMA boundaries. The Subbasin and Basin were identified as high-priority basins in 2014 through the CASGEM prioritization process.

Cuyama Basin GSA (CBGSA)

The Cuyama Basin DWR Basin No. 3-13) underlies Santa Barbara, Kern and Ventura Counties. On June 12, 2017, the CBGSA posted notice to act as the GSA for the entire basin. The CBGSA is a joint powers authority comprised of six local agencies including the Cuyama Basin Water District, Cuyama Community Services District, Santa Barbara County Water Agency, San Luis Obispo County, Ventura County and Kern County. These six agencies collectively carry water management, water supply, and land use responsibilities across the entire basin.

Fillmore and Piru Basins GSA

The Fillmore and Piru Subbasins (DWR Basin Nos. 4-004.05 and 4-004.06) lie along the eastern portion of the Santa Clara River. On June 28, 2017, the Fillmore and Piru Basins GSA posted notice to act as the GSA for both basins. The Fillmore and Piru Basins GSA is a joint powers authority comprised of the UWCD, Ventura County and the City of Fillmore. UWCD is authorized to conduct water resource investigations, acquire water rights, build water storage and recharge facilities, construct wells and pipelines for water deliveries, commence actions involving water rights and water use, and prevent interference with or diminution of stream/river flows. The County exercises water management and land use authority throughout the county, including the Fillmore and Piru Basins. The City of Fillmore is a local municipality that exercises water supply, water management and land use authority within the city's boundaries.

Mound Basin GSA (MBGSA)

The MBGSA posted notice with the DWR on June 29, 2017 to be the GSA for the Mound Subbasin (DWR Basin No. 4-004.03). MBGSA is a joint powers authority comprised of three local public agencies: the City

[17] Unmanaged areas are areas in high or medium priority basins in which a local agency has not filed to become a GSA and are not within the service area of another GSA.

of Ventura, Ventura County, and UWCD. The City of Ventura exercises water supply, water management and land use authority within its boundaries. The County exercises water management and land use authority in land overlying the Subbasin. UWCD is authorized to replenish but not extract groundwater.

Fox Canyon Groundwater Management Agency

On February 11, 2015, the FCGMA notified the DWR of their intent to become the exclusive GSA for the Arroyo Santa Rosa Basin (DWR Basin No. 4-007), Oxnard Subbasin, Pleasant Valley Basin and the Las Posas Valley Basin. The FCGMA's authority is limited to basin portions that lie within its boundary. The FCGMA is the exclusive GSA for those basins within the agency's statutory boundaries.

Ojai Basin Groundwater Management Agency (OBGMA)

The OBGMA filed a notice of intent to become the exclusive GSA for the Ojai Valley Groundwater Basin (DWR Basin No. 4-002) on December 6, 2014. The OBGMA submitted an analysis of their basin conditions on December 22, 2016 in lieu of preparing a GSP plan.

Upper Ventura River Groundwater Agency (UVRGA)

The UVRGA filed a notice of intent to become the GSA for the Ventura River Valley, Upper Ventura River Subbasin (DWR Basin No. 4-003.01) on April 21, 2017. The UVRGA is a joint powers authority comprised CMWD, the City of Ventura, Ventura County, Meiners Oaks Water District, and the Ventura River Water District. Prior to GSA formation, the Upper Ventura River Basin boundary was modified, reducing the area.

The County of Ventura

On June 28, 2017, the County notified DWR of their intent to become the GSA for all areas in basins outside of the management of a GSA. The notice was filed to prevent a basin from being designated as a "probationary basin" if unmanaged areas existed after June 30, 2017. There are no unmanaged areas of a basin within the County.

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Appendices

Appendix A – Glossary of Groundwater Terms

Aquifer: A geologic formation or structure that yields water in sufficient quantities to supply pumping wells or springs.

Abandoned Well: Means any of the following:

(1) A water well used less than 8 hours in any twelve-month period. Failure to submit reports of well usage will result in a well being classified as abandoned.
(2) A monitoring well from which no monitoring data has been taken for a period of two years.
(3) A well which is in such a state of disrepair that it cannot be made functional for its original use or any other use.
(4) An open engineering test hole after 24 hours has elapsed after construction and testing work has been completed on the site.
(5) A cathodic protection well which is no longer used for its intended purpose.

Confined Aquifer: An aquifer separated from the surface by an aquiclude or an aquitard to the extent that pressure can be created in the lower reaches of the aquifer.

Contamination: Alteration of waters by waste, salt-water intrusion or other materials to a degree which creates a hazard to the public health through actual or potential poisoning or through actual or potential spreading of disease.

Department of Water Resources: (DWR) operates and maintains the State Water Project, including the California Aqueduct. The department also provides dam safety and flood control services, assists local water districts in water management and conservation activities, promotes recreational opportunities, and plans for future statewide water needs.

Fox Canyon Groundwater Management Agency (FCGMA): The Agency created when the California State Legislature enacted and passed State Assembly Bill No. 2995 on Sept. 13, 1982 creating the *Fox Canyon Groundwater Management Agency (GMA)*. This law, also referred to as AB2995, granted jurisdiction over all lands overlying the Fox Canyon aquifer zone to control seawater intrusion, protect water quality, and manage water resources.

Groundwater: Water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water.

Groundwater Basin: A geologically and hydrologically defined area containing one or more aquifers, which store and transmit water yielding significant quantities of water to extraction facilities.

Lower Aquifer System (LAS): The area underlying the Oxnard Pressure Basin, which contains the Hueneme aquifer, the Fox Canyon Aquifer and the Grimes Canyon aquifer. The LAS is recharged from the Fox Canyon and Grimes Canyon Outcrops, the areas where the aquifers come to the surface exposing the permeable sands and gravels to recharge from rainfall and surface runoff.

Overdraft: The condition of a groundwater basin or aquifer where the average annual amount of water extracted exceeds the average annual supply of water to a basin or aquifer.

Perched or Semi-Perched Aquifer: The water-bearing area that is located between the earth's surface and clay deposits that exist above an Aquifer.

Receiving Waters: All waters that are "Waters of the State" within the scope of the State Water Code, including but not limited to, natural streams, creeks, rivers, reservoirs, lakes, ponds, water in vernal pools, lagoons, estuaries, bays, the Pacific Ocean, and ground water.

Seawater Intrusion: The overdrafting of aquifers, which results in, the depletion of water supplies, lowering of water levels and degradation from seawater intrusion. Seawater intrusion results from the reversal of hydrostatic pressure allowing water flow to be onshore rather than offshore.

Total Dissolved Solids: (TDS) is a term that represents the amount of all of our natural minerals that is dissolved in water.

Total Maximum Daily Load (TMDL) is a number that represents the assimilative capacity of a receiving water to absorb a pollutant. The TMDL is the sum of the individual waste-load allocations for point sources, load allocations for nonpoint sources plus an allotment for natural background loading, and a margin of safety. TMDL's can be expressed in terms of mass per time (the traditional approach) or in other ways such as toxicity or a percentage reduction or other appropriate measure relating to a state water quality objective. A TMDL is implemented by reallocating the total allowable pollution among the different pollutant sources (through the permitting process or other regulatory means) to ensure that the water quality objectives are achieved.

United Water Conservation District (UWCD): The District administers a "basin management" program for the Santa Clara Valley and Oxnard Plain, utilizing the surface flow of the Santa Clara River and its tributaries for replenishment of groundwater. Originally established as the Santa Clara River Water Conservation District in 1927.

Upper Aquifer System (UAS): The area underlying the Oxnard Pressure Basin, which contains the perched and semi-perched zones, the Oxnard aquifer zone, and the Mugu aquifer. The UAS is recharged via the twenty-three square miles unconfined Oxnard Forebay Basin near El Rio.

Water Quality Standards: Defined as the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.) of water and the water quality objectives adopted by the State or the United States Environmental Protection Agency to protect those uses.

Water Well Ordinance No. 4468: The Ventura County Groundwater Conservation Ordinance which was originally adopted by the Board of Supervisors in October 1970 and revised in 1979, 1984, 1985, 1987, 1991, 1999 and most recently in December 2014. The purpose of the ordinance is to ensure that all new or modified water, cathodic protection and monitoring wells are drilled by licensed water well contractors and are properly sealed so that they cannot serve as conduits for the movement of poor quality or polluted waters into useable aquifers or be hazardous to people or animals.

Well Destruction: To fill a well (including both interior and annular spaces if the well is cased) completely in such a manner that it will not produce water or act as a conduit for the transmission of water between any water-bearing formations penetrated.

Well Owner: The owner of the land on which a well is located.

Appendix B – Key Water Level Hydrographs

FIGURES | Page

Appendix B – Key Water Level Wells

Figure B-1: Key water level wells in Ventura County.

Appendix B – Key Water Level Wells

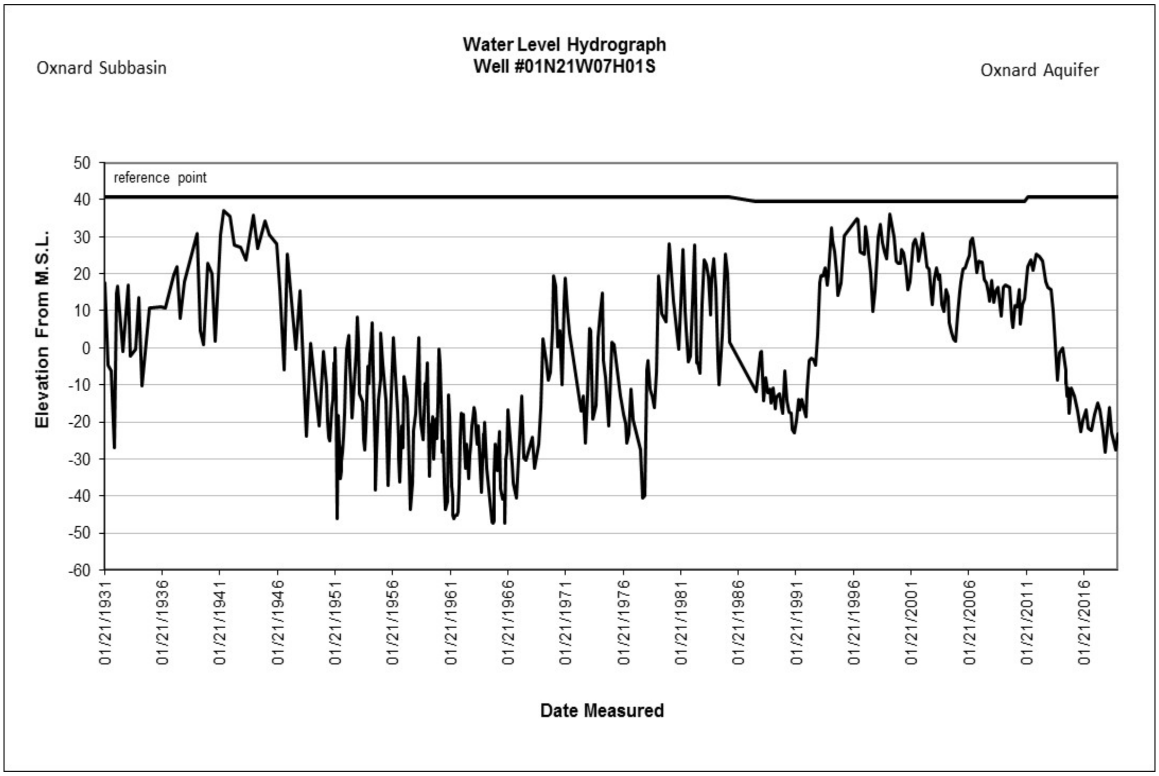

Figure B-2: Oxnard Aquifer key well hydrograph.

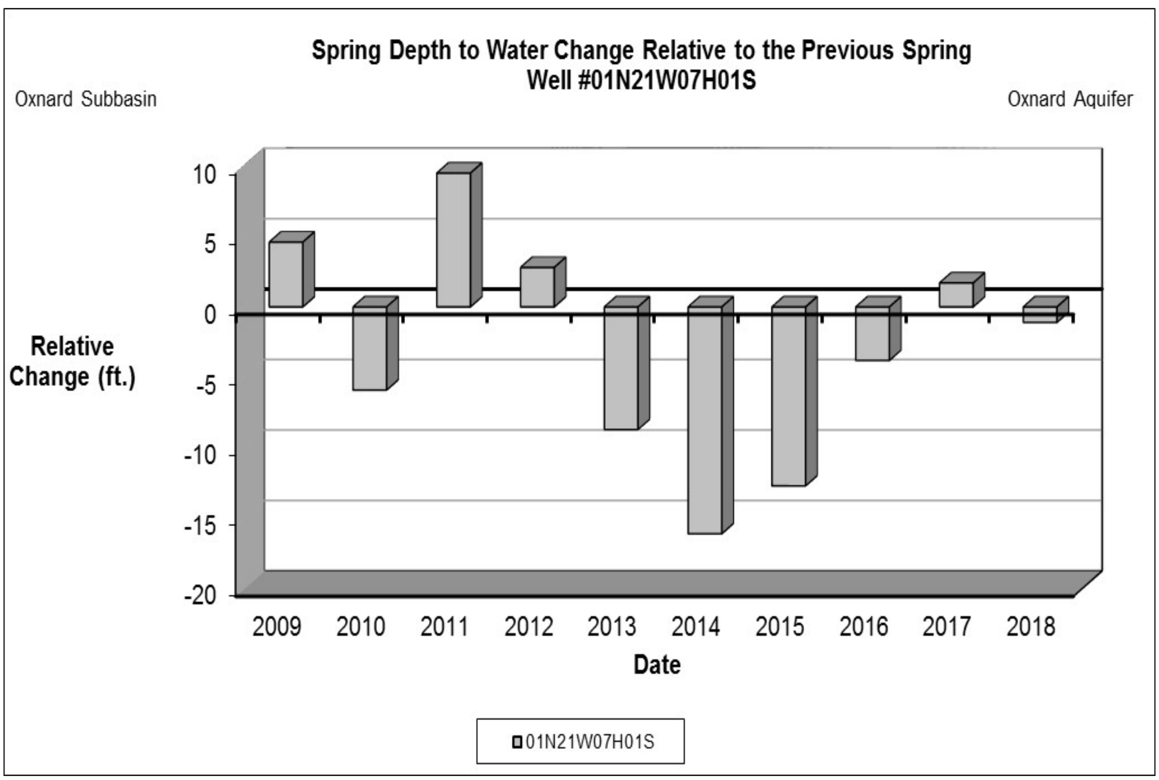

Figure B-3: Oxnard Aquifer 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

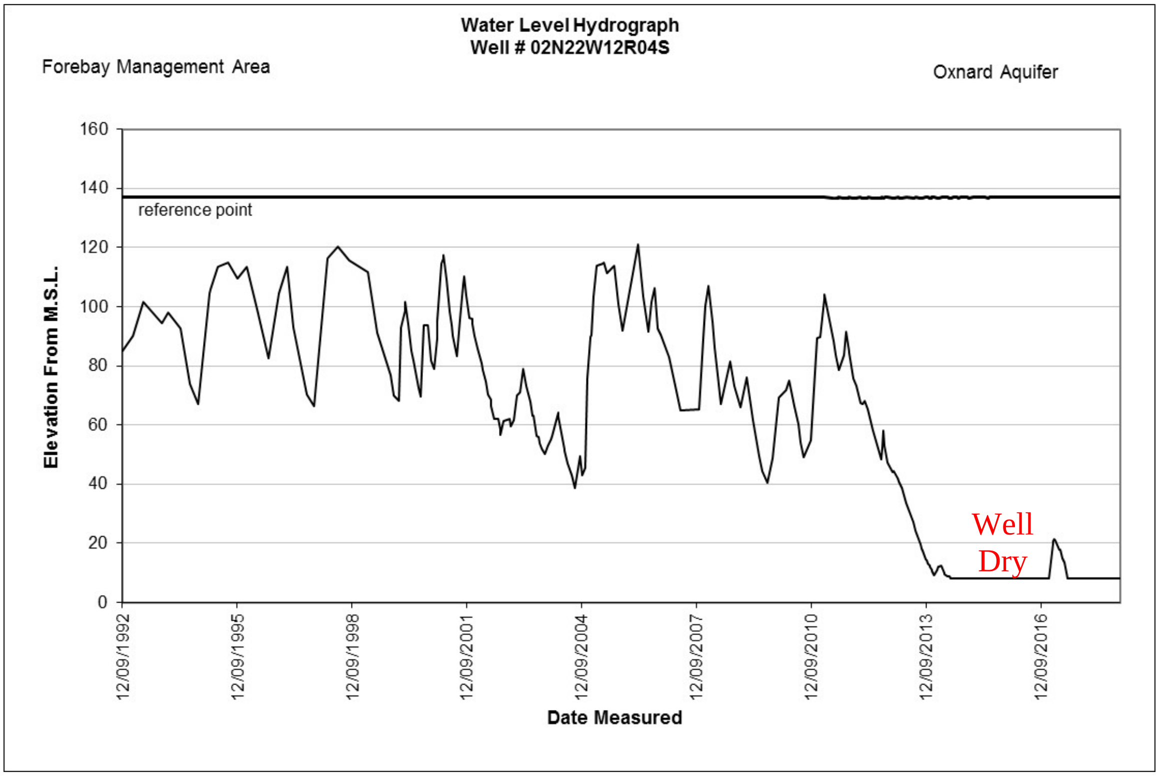

Figure B-4: Forebay Area key well hydrograph.

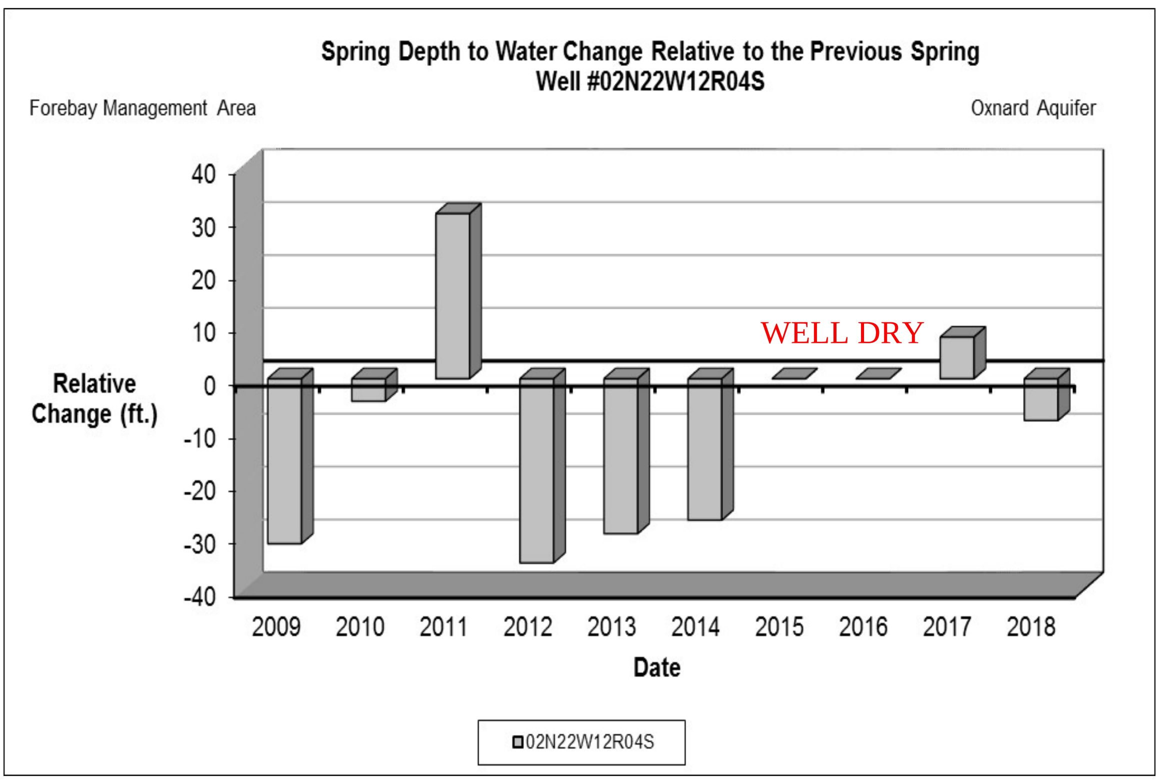

Figure B-5: Forebay Management 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

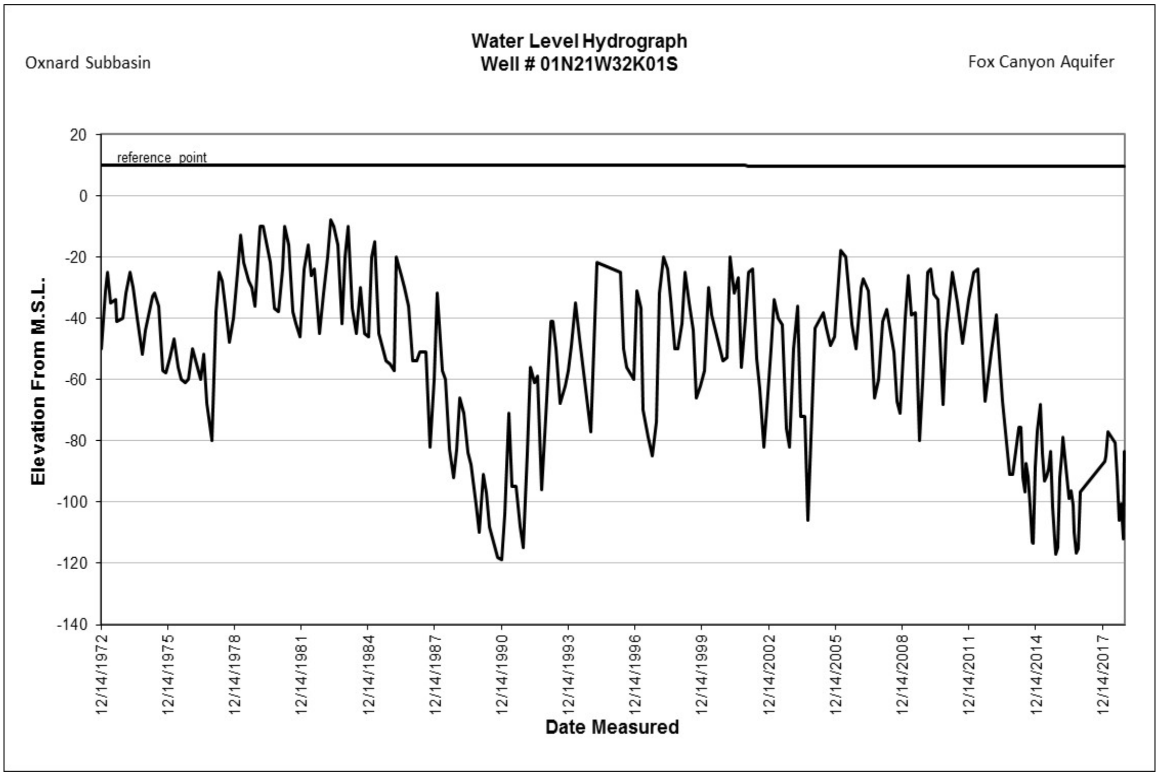

Figure B-6: Oxnard Subbasin Fox Canyon Aquifer key well hydrograph.

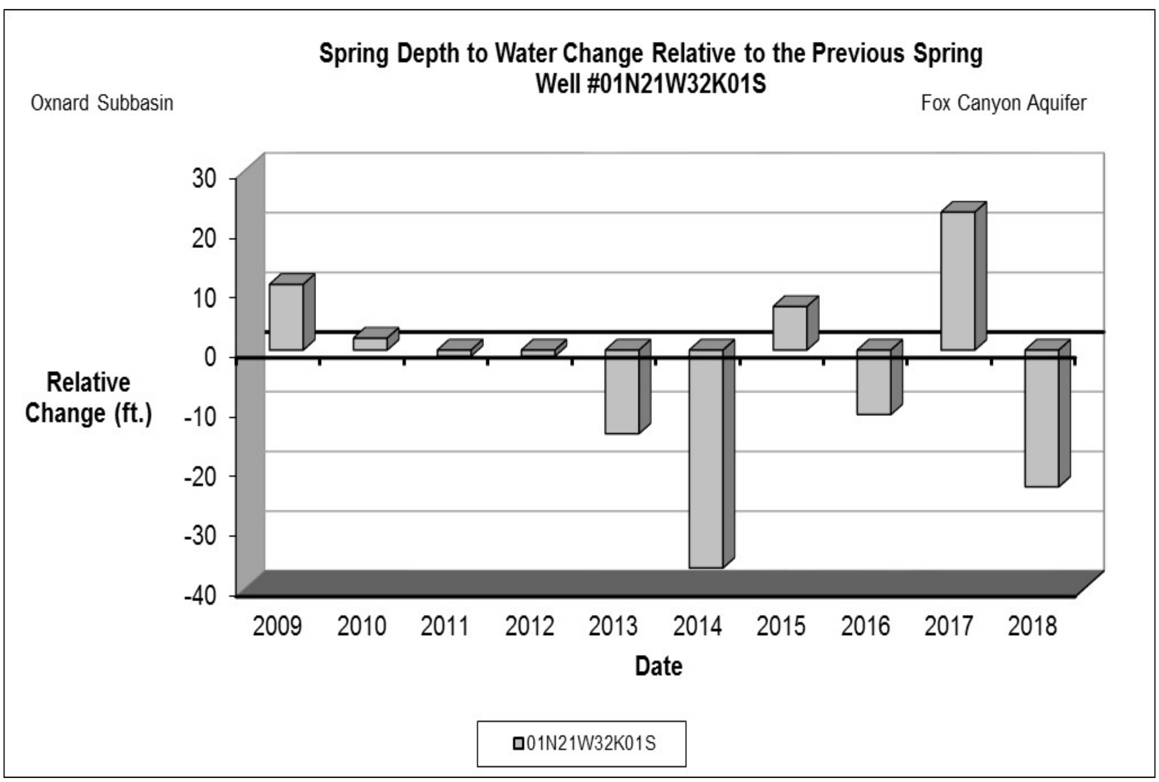

Figure B-7: Oxnard Subbasin Fox Canyon Aquifer 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

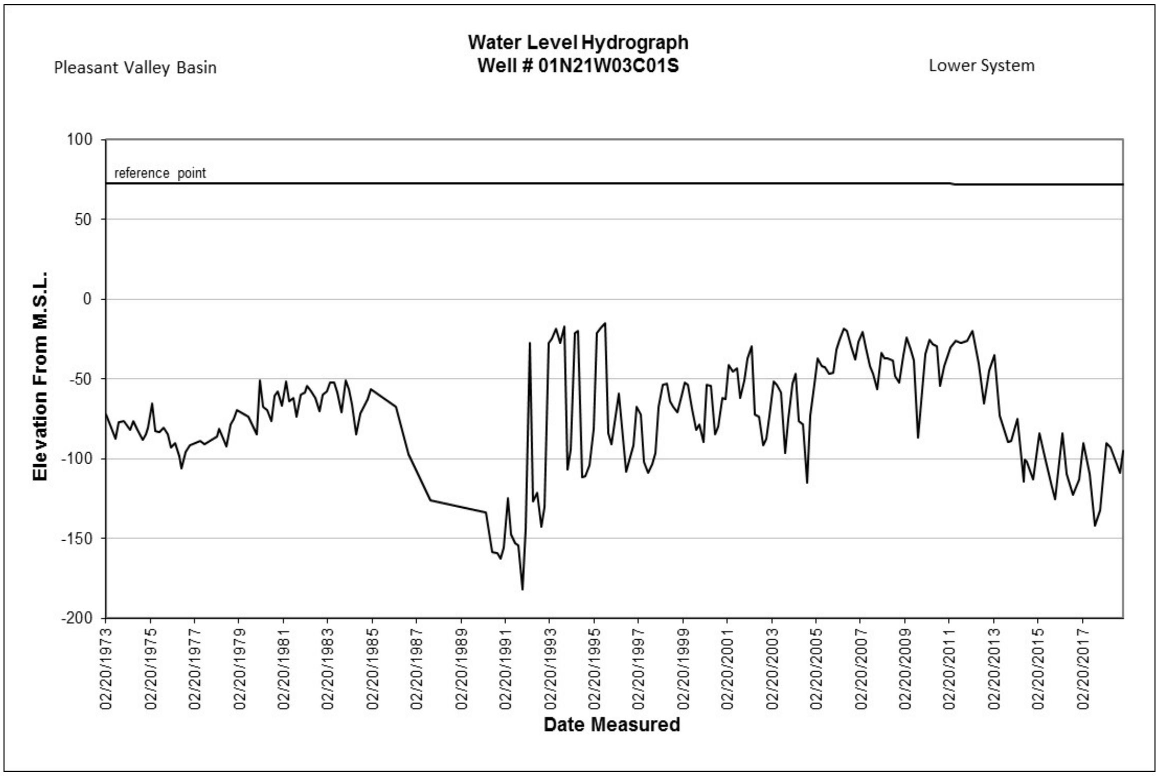

Figure B-8: Pleasant Valley Basin Lower Aquifer System key well hydrograph.

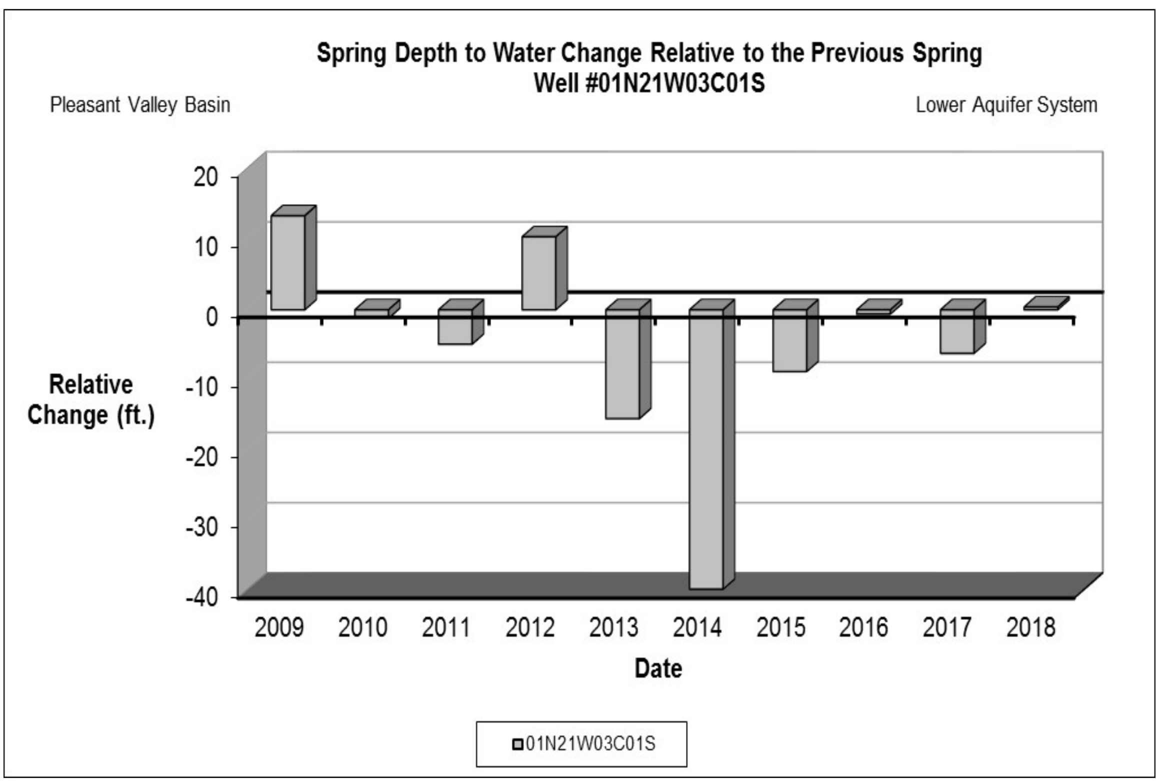

Figure B-9: Pleasant Valley Basin Lower Aquifer System 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

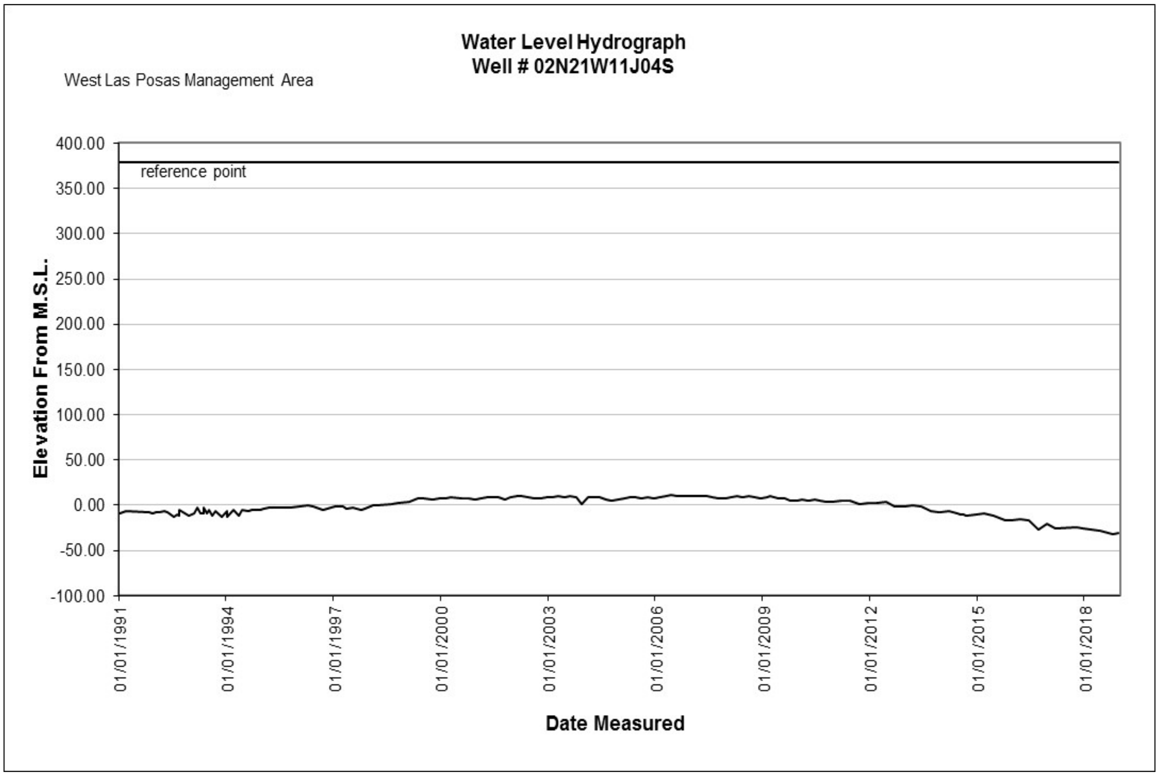

Figure B-10: West Las Posas Management Area key well hydrograph.

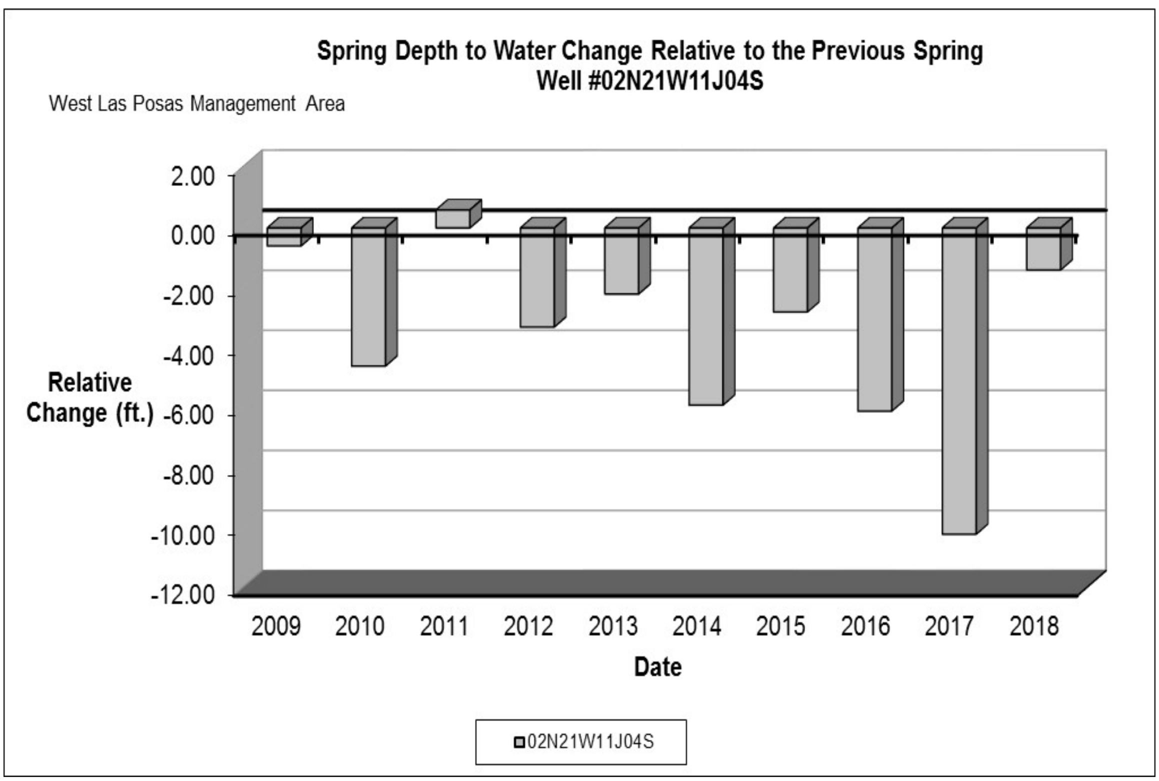

Figure B-11: West Las Posas Management Area 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

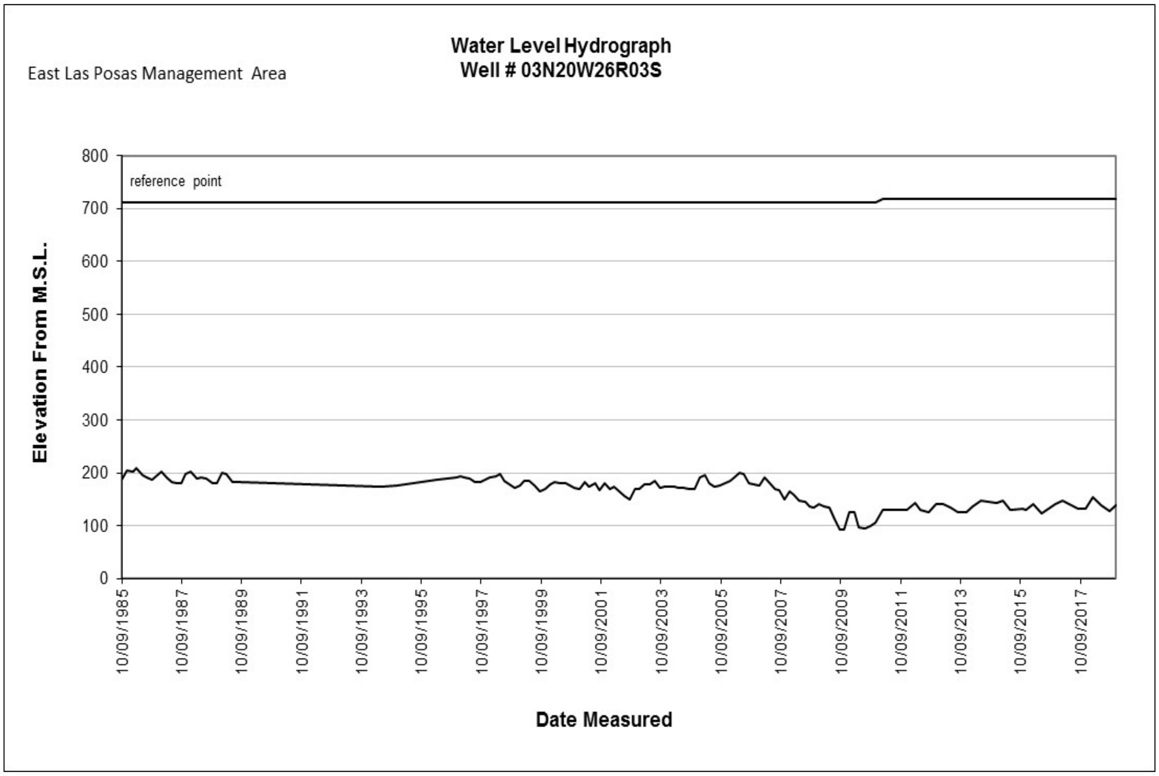

Figure B-12: East Las Posas Management Area key well hydrograph.

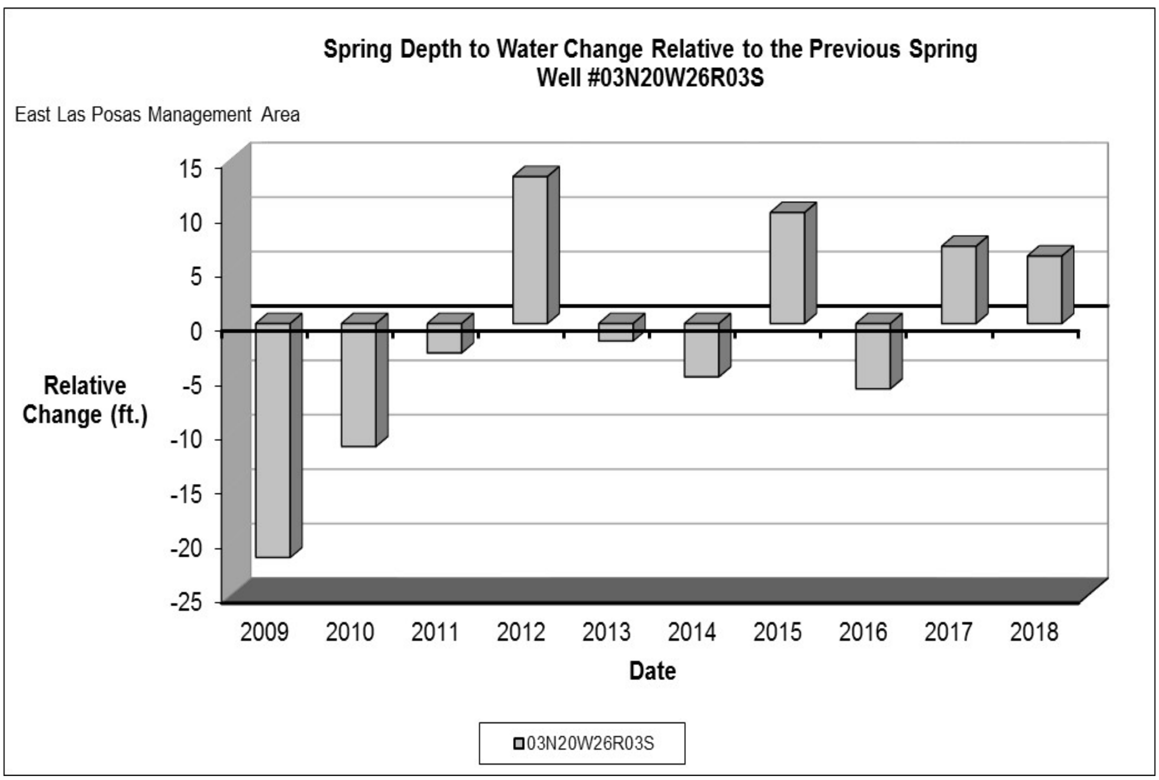

Figure B-13: East Las Posas Management Area 10-year spring level change Up/Down graph.

Appendix B – Key Water Level Wells

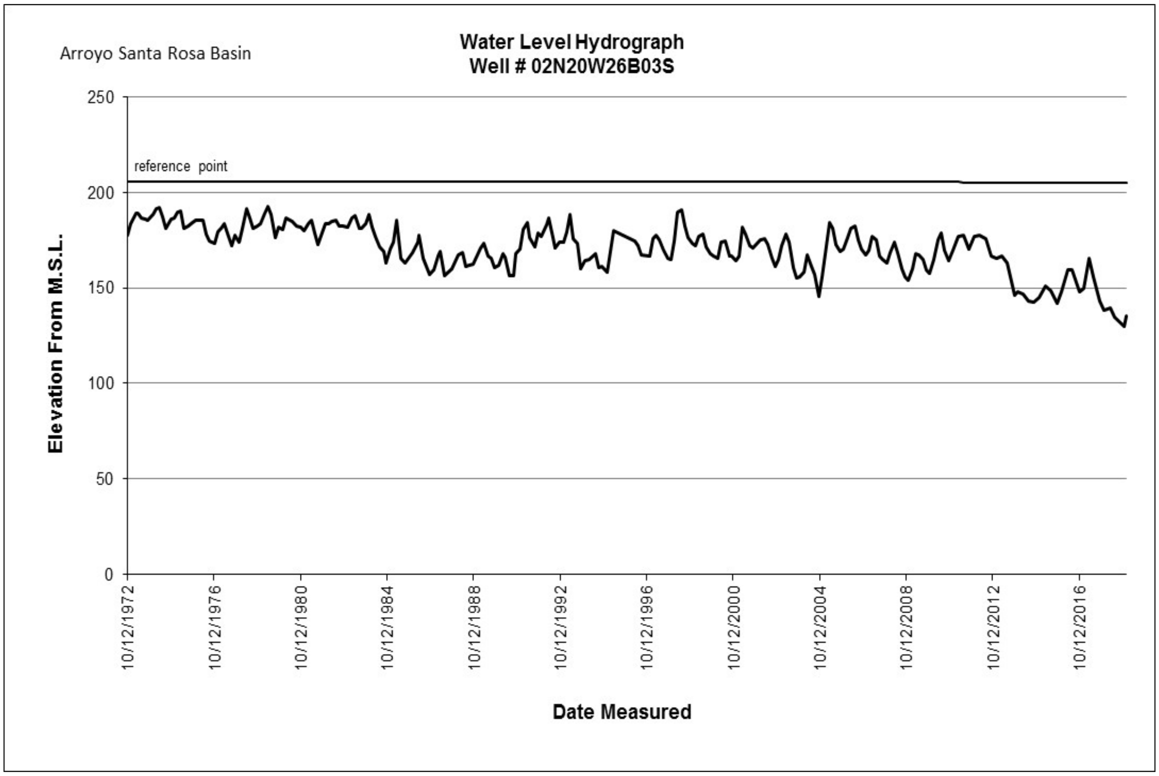

Figure B-14: Arroyo Santa Rosa Basin key well hydrograph.

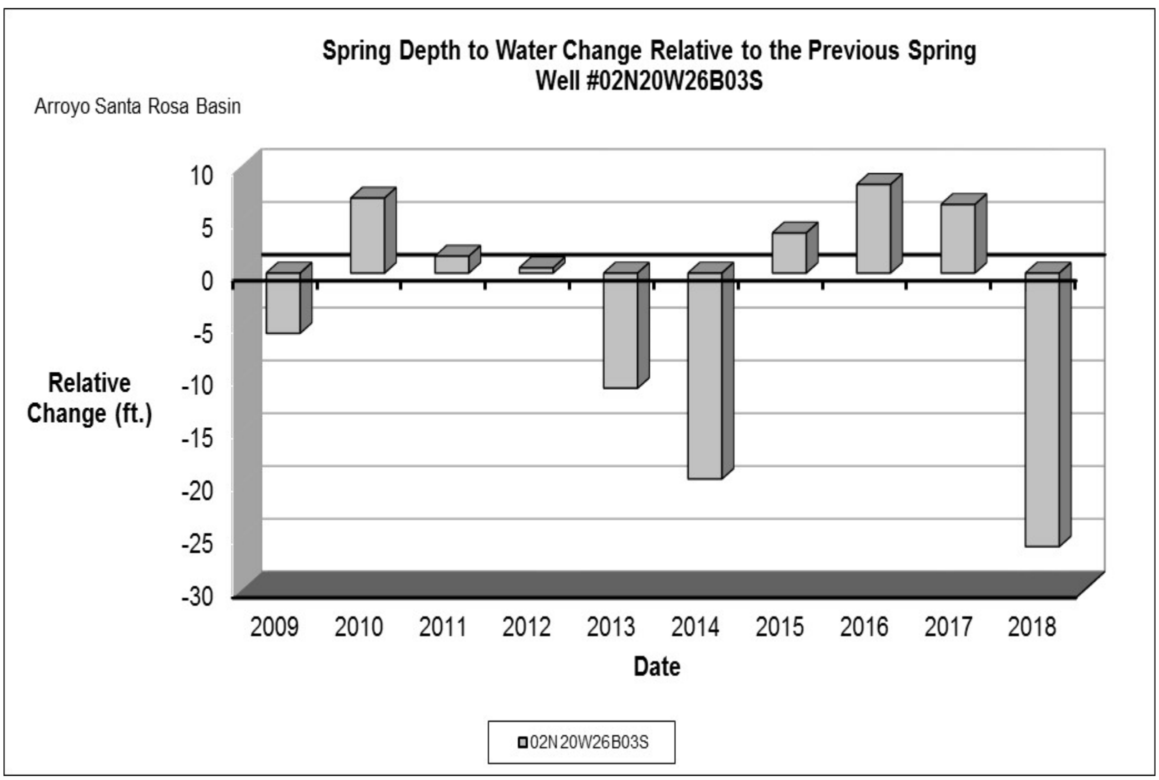

Figure B-15: Arroyo Santa Rosa Basin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

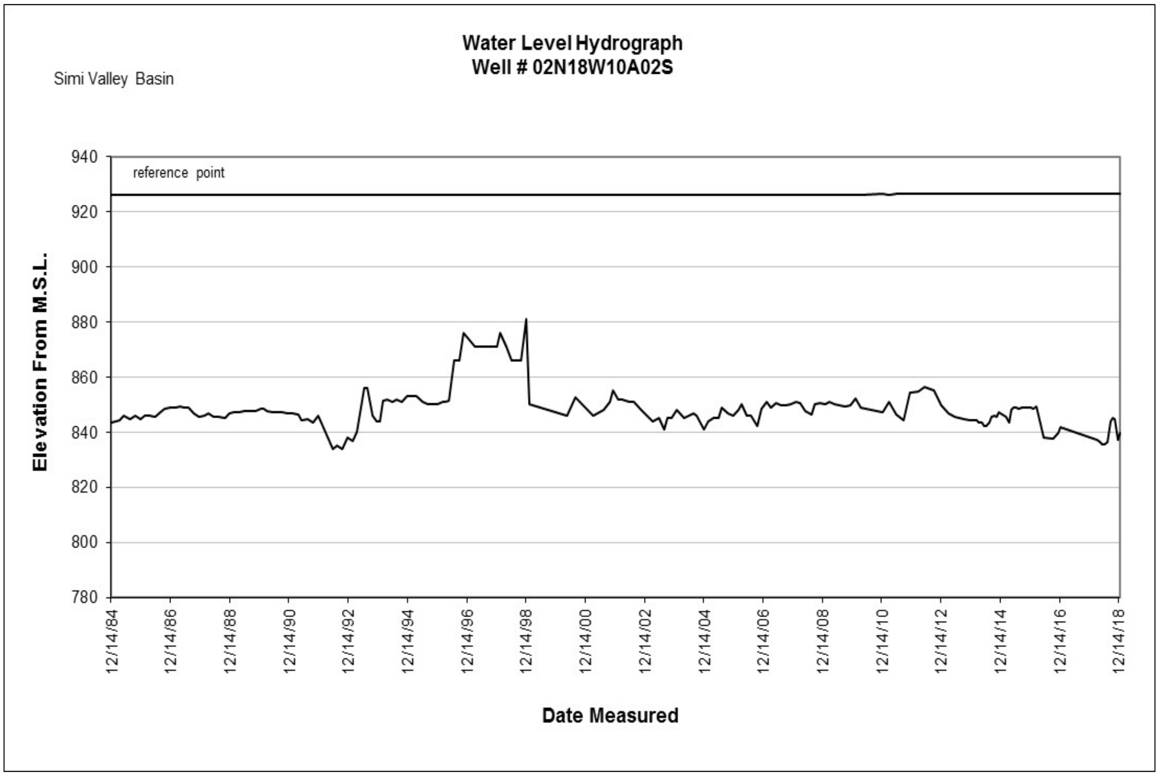

Figure B-16: Simi Valley Basin key well hydrograph.

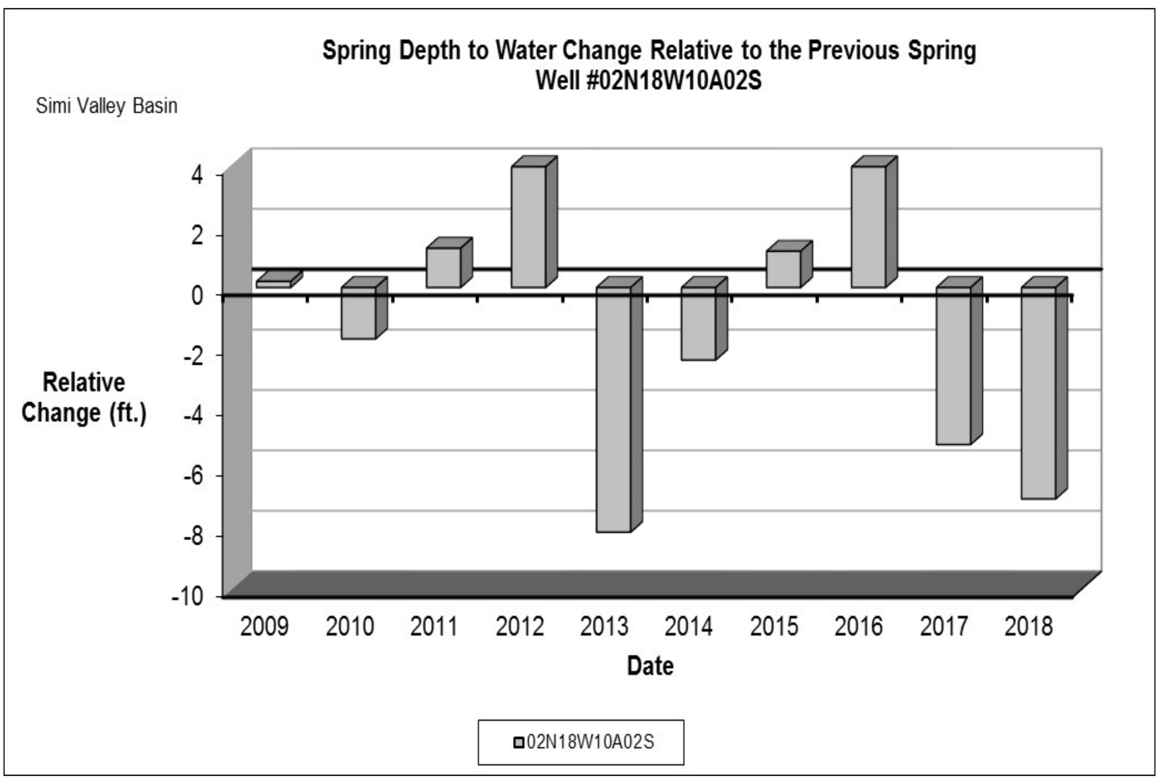

Figure B-17: Simi Valley Basin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

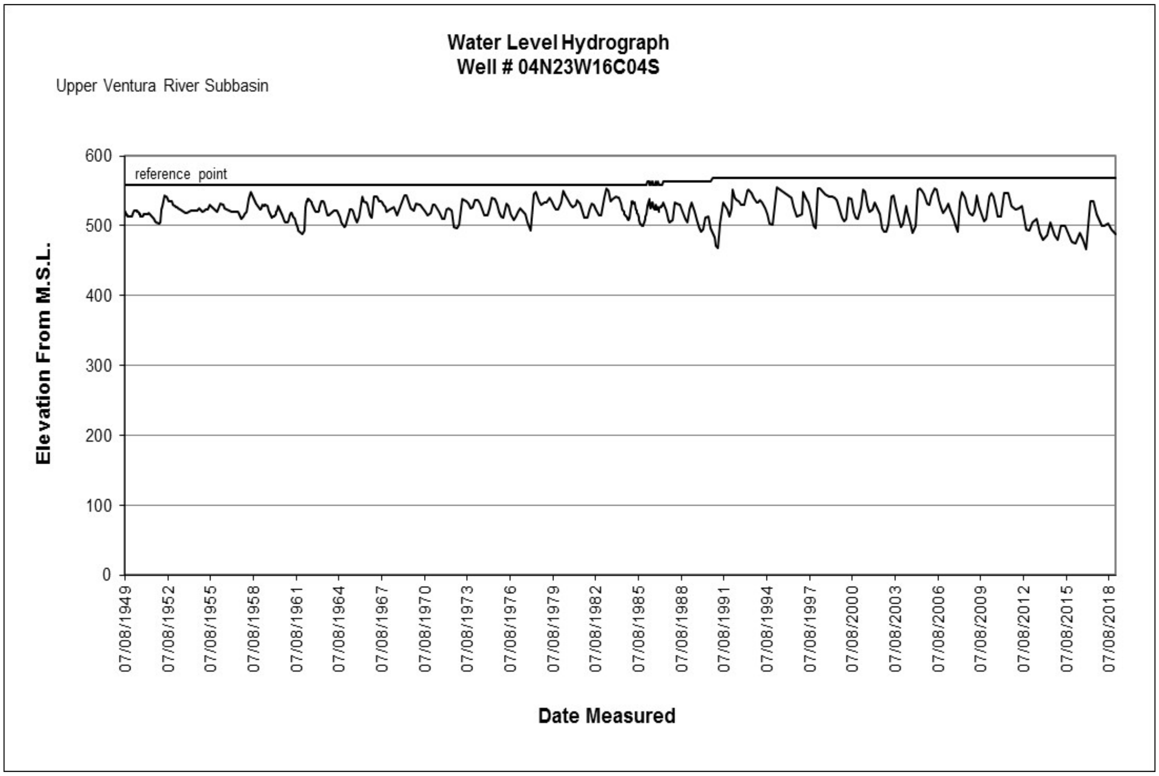

Figure B-18: Upper Ventura River Subbasin key well hydrograph.

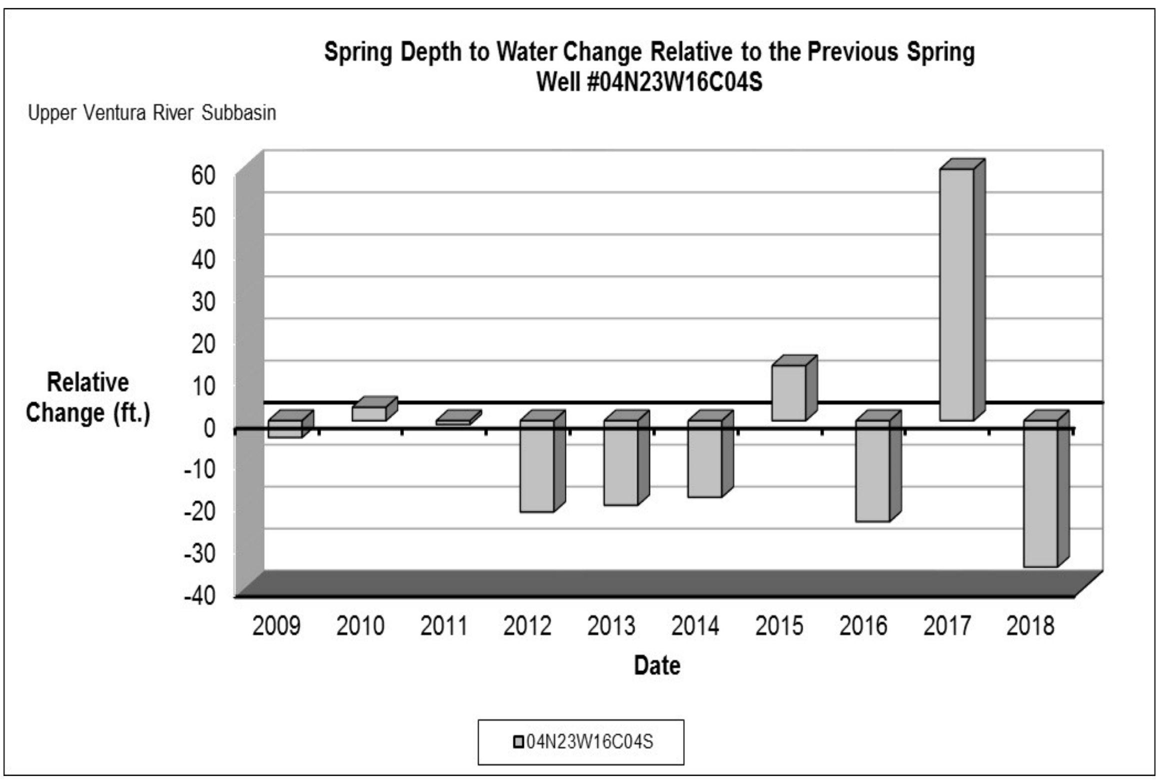

Figure B-19: Upper Ventura River Subbasin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

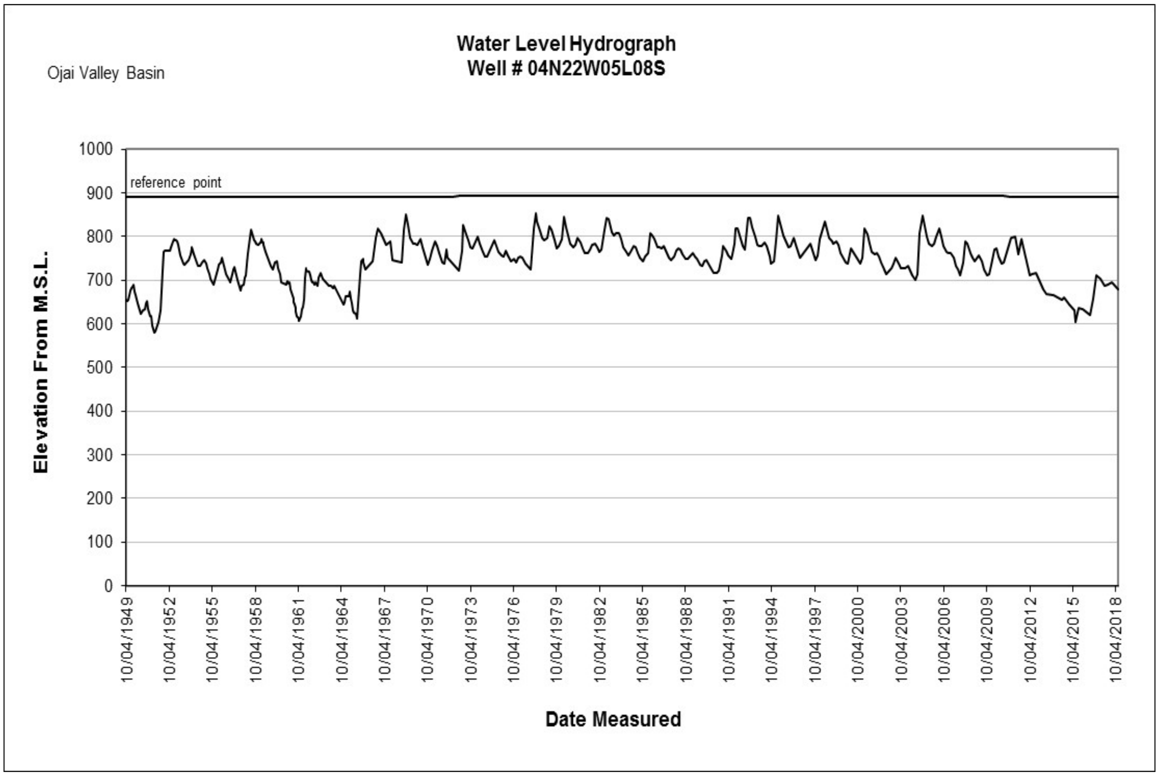

Figure B-20: Ojai Valley Basin key well hydrograph.

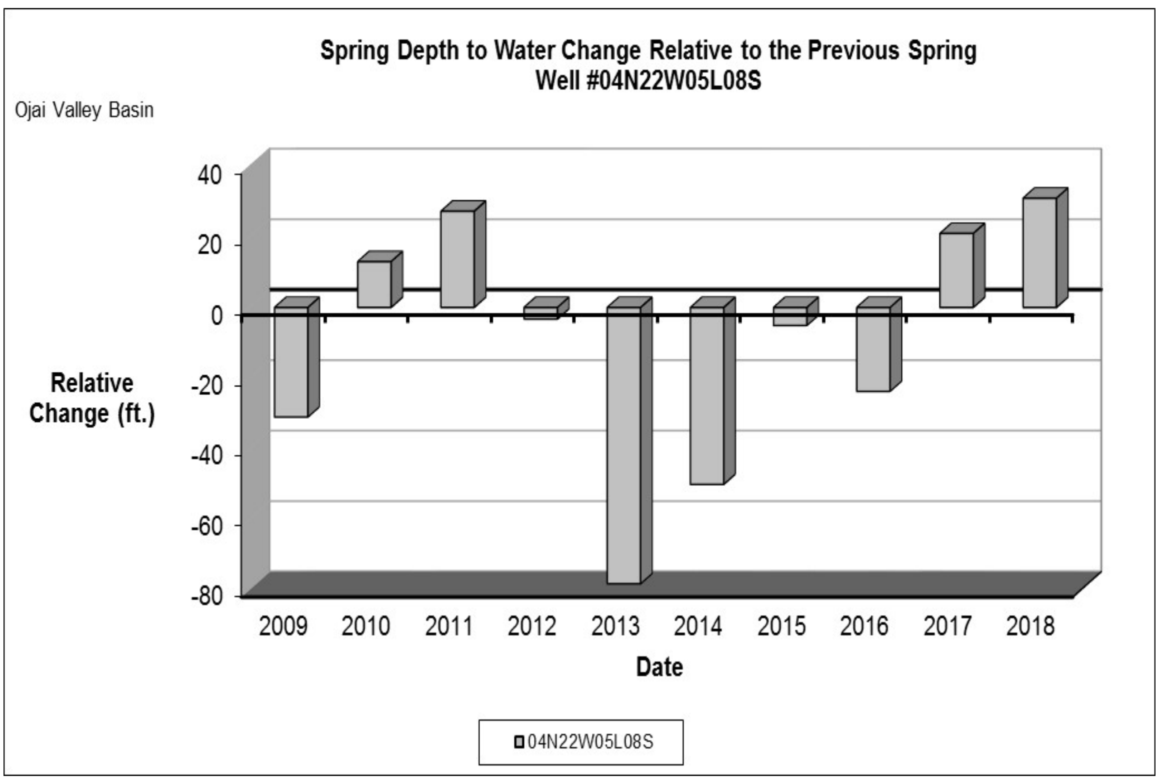

Figure B-21: Ojai Valley Basin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

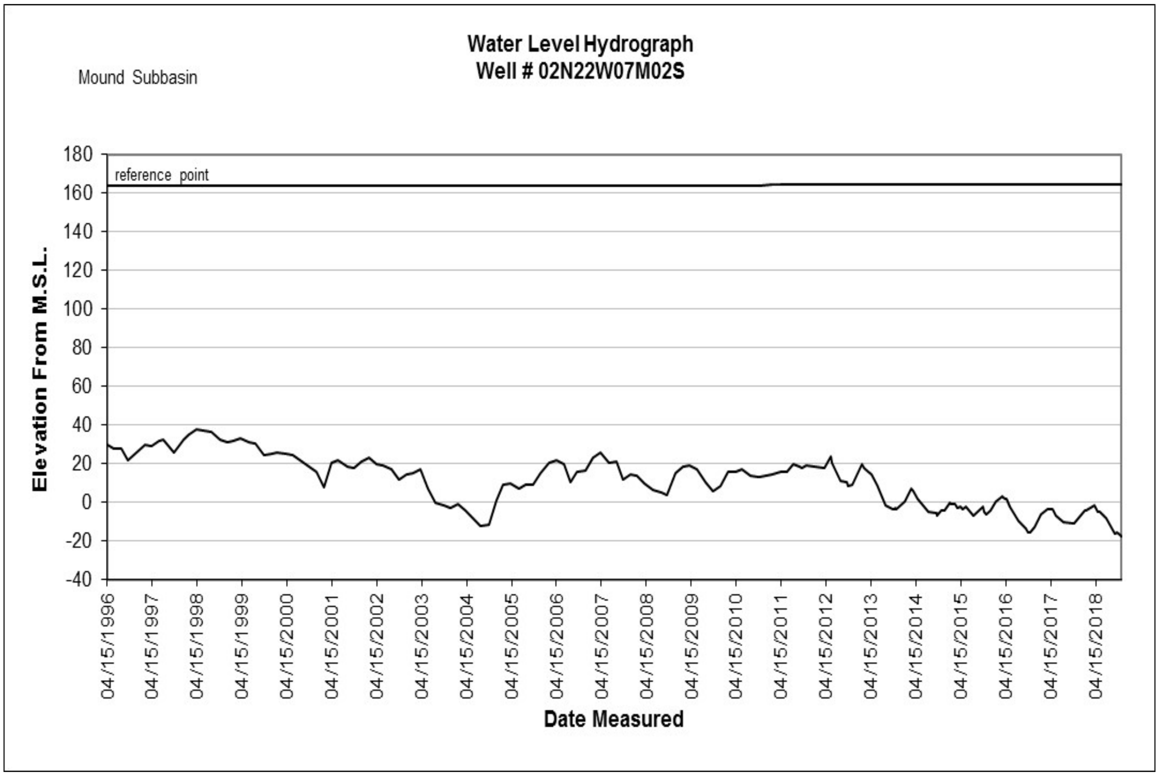

Figure B-22: Mound Subbasin key well hydrograph.

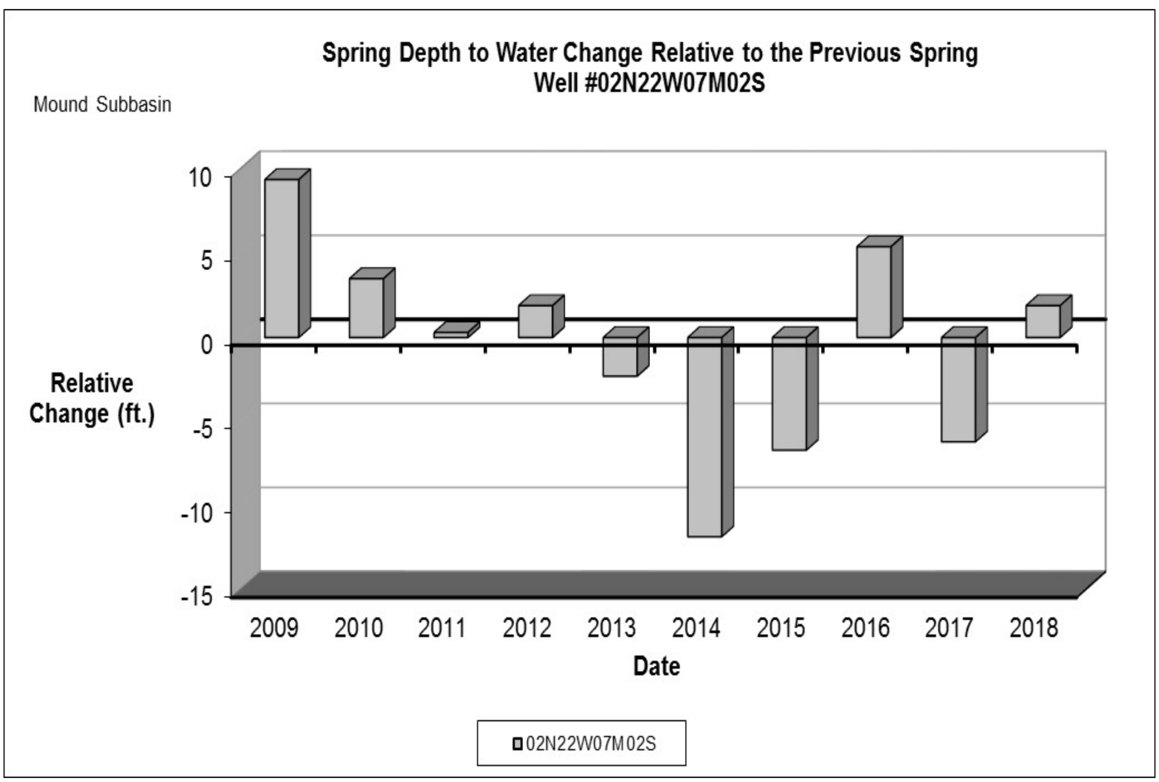

Figure B-23: Mound Subbasin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

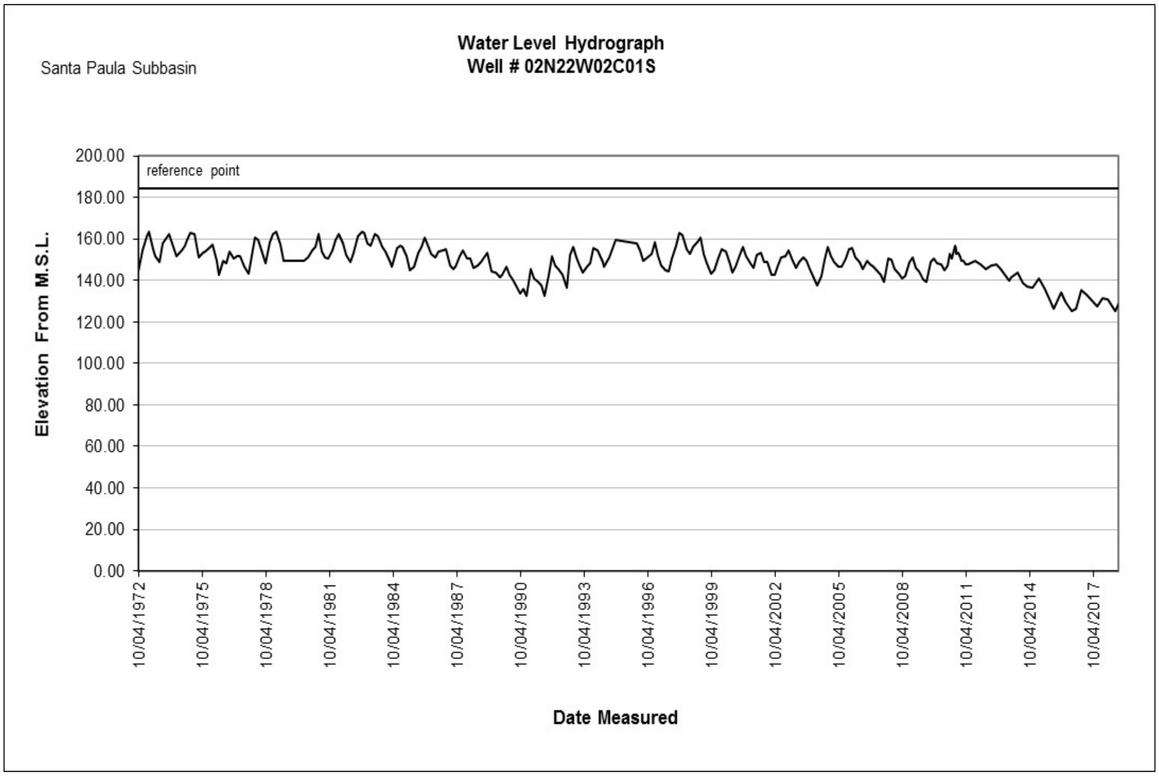

Figure B-24: Santa Paula Subbasin key well hydrograph.

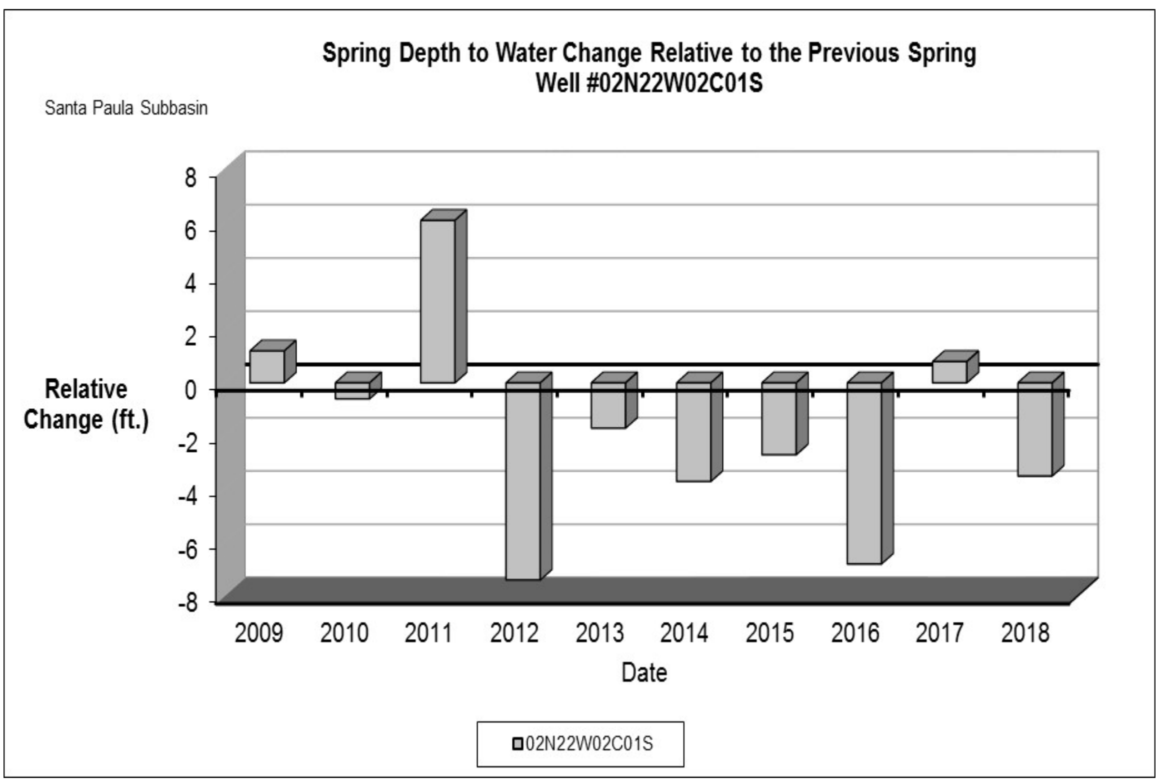

Figure B-25: Santa Paula Subbasin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

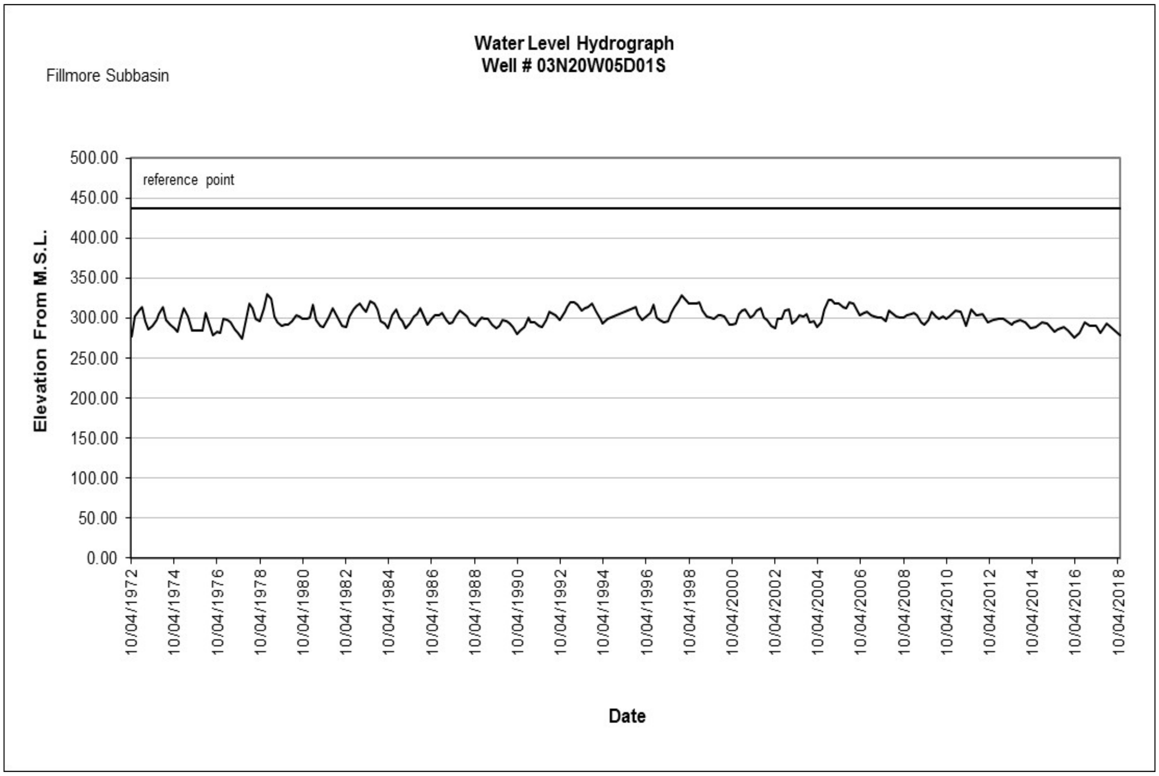

Figure B-26: Fillmore Subbasin key well hydrograph.

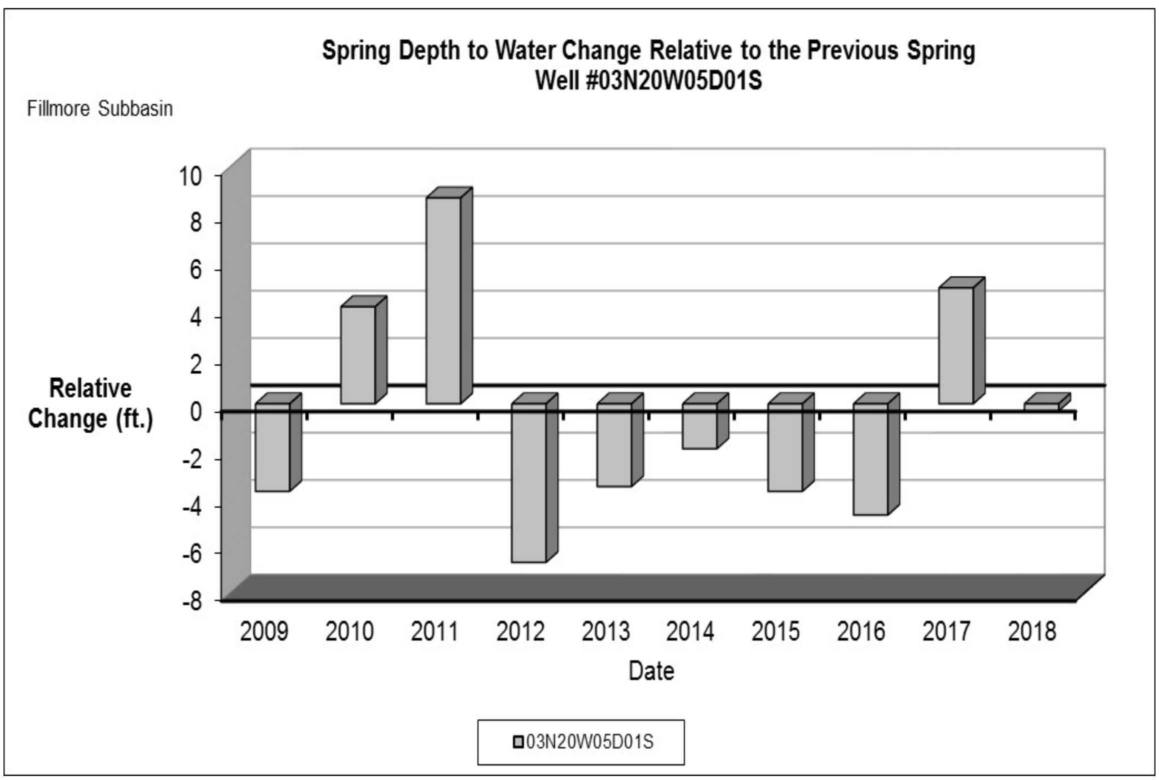

Figure B-27: Fillmore Subbasin 10-year spring level change Up/Down graph.

Appendix B – Key Water Level Wells

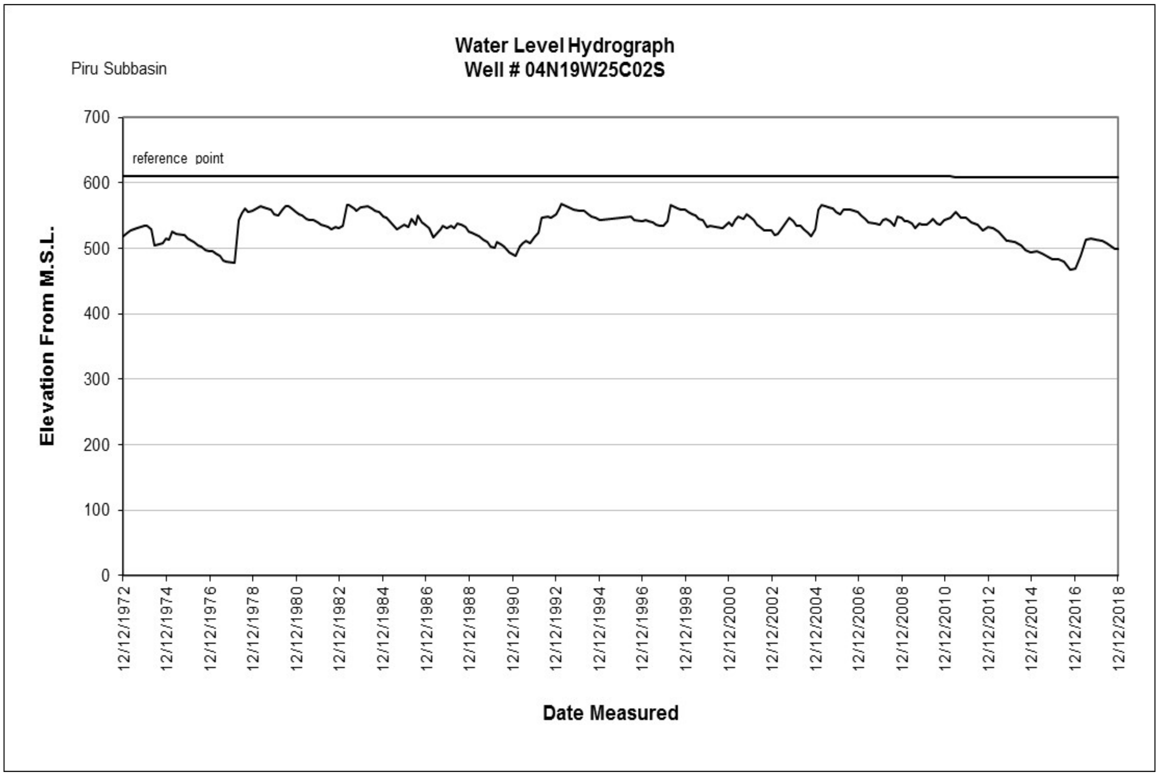

Figure B-28: Piru Subbasin key well hydrograph.

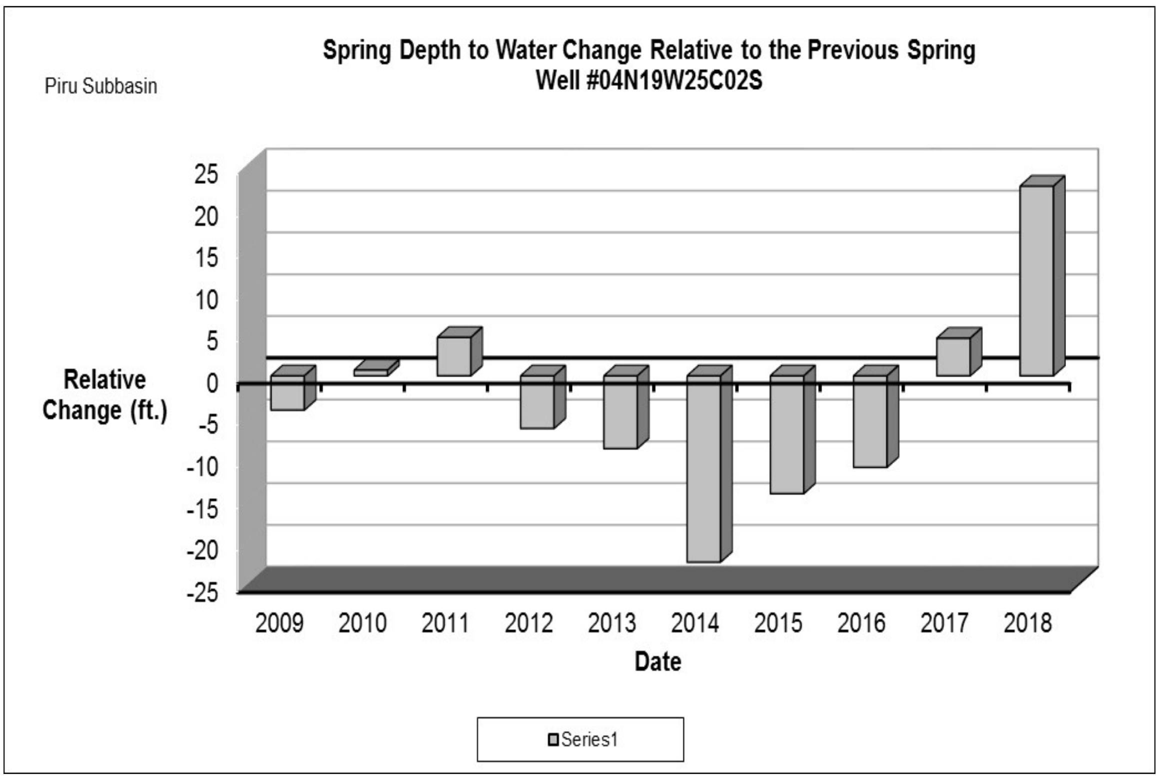

Figure B-29: Piru Subbasin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

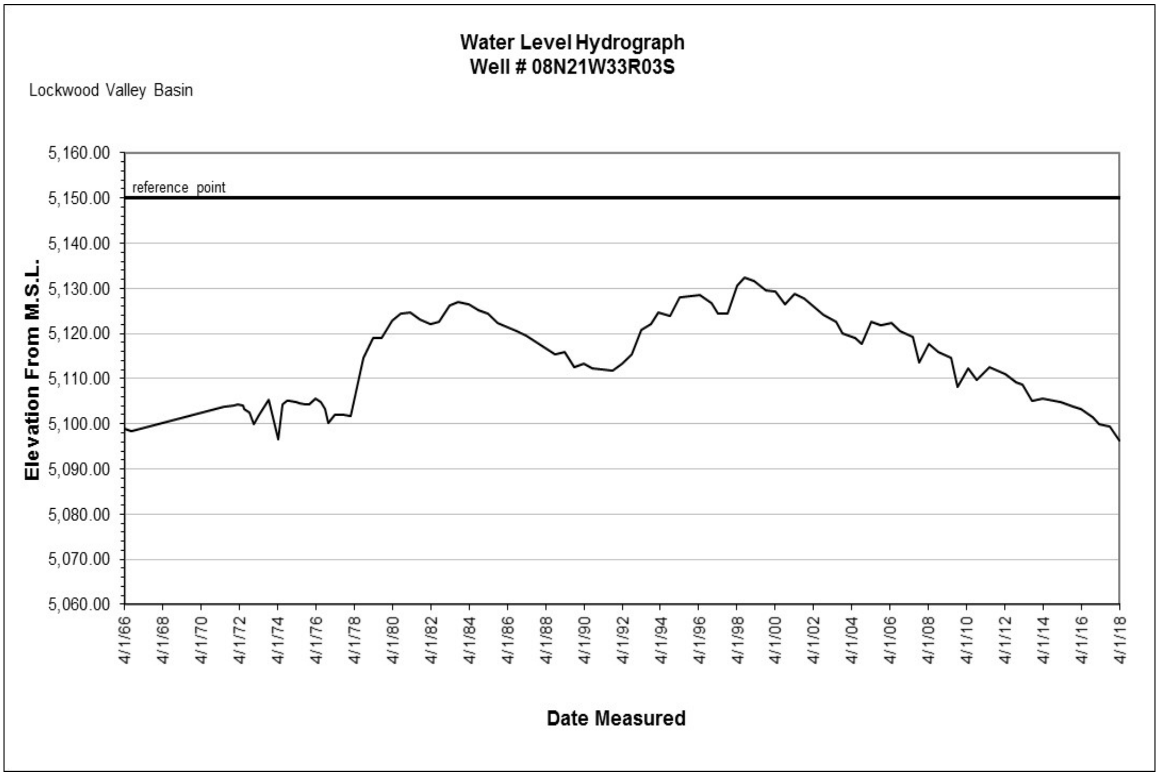

Figure B-30: Lockwood Valley Basin key well hydrograph.

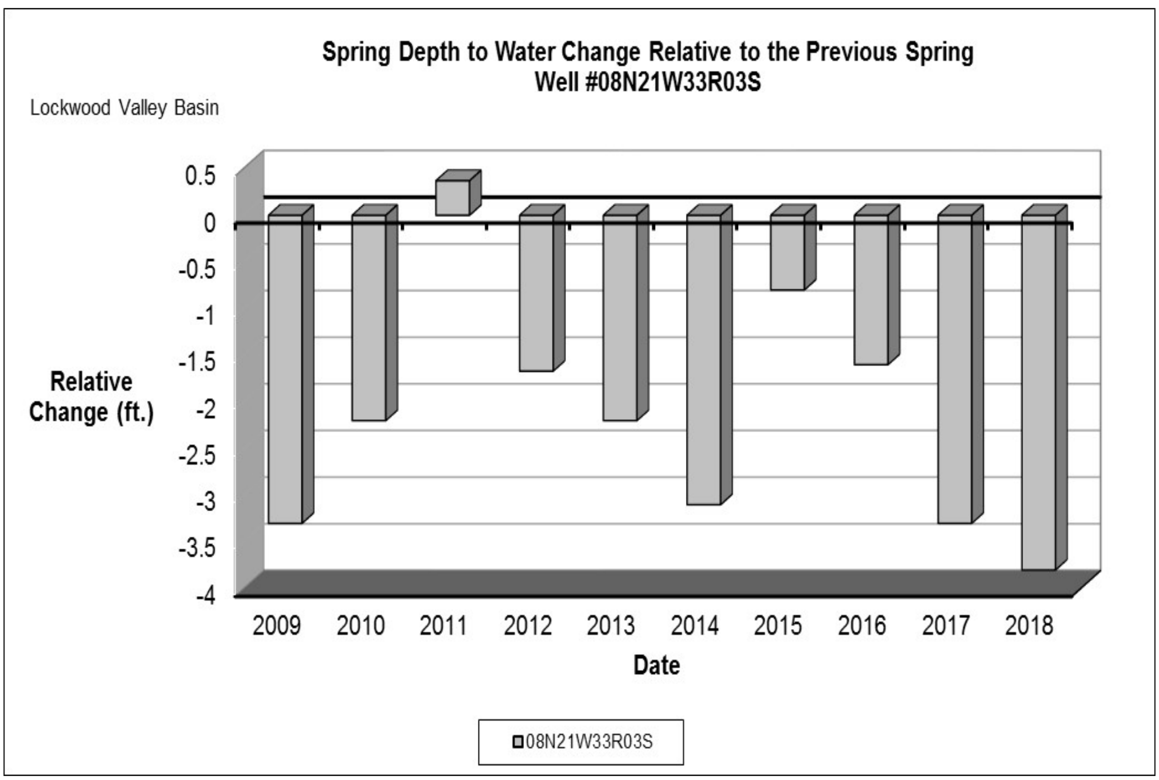

Figure B-31: Lockwood Valley Basin 10-year Spring level change Up/Down graph.

Appendix B – Key Water Level Wells

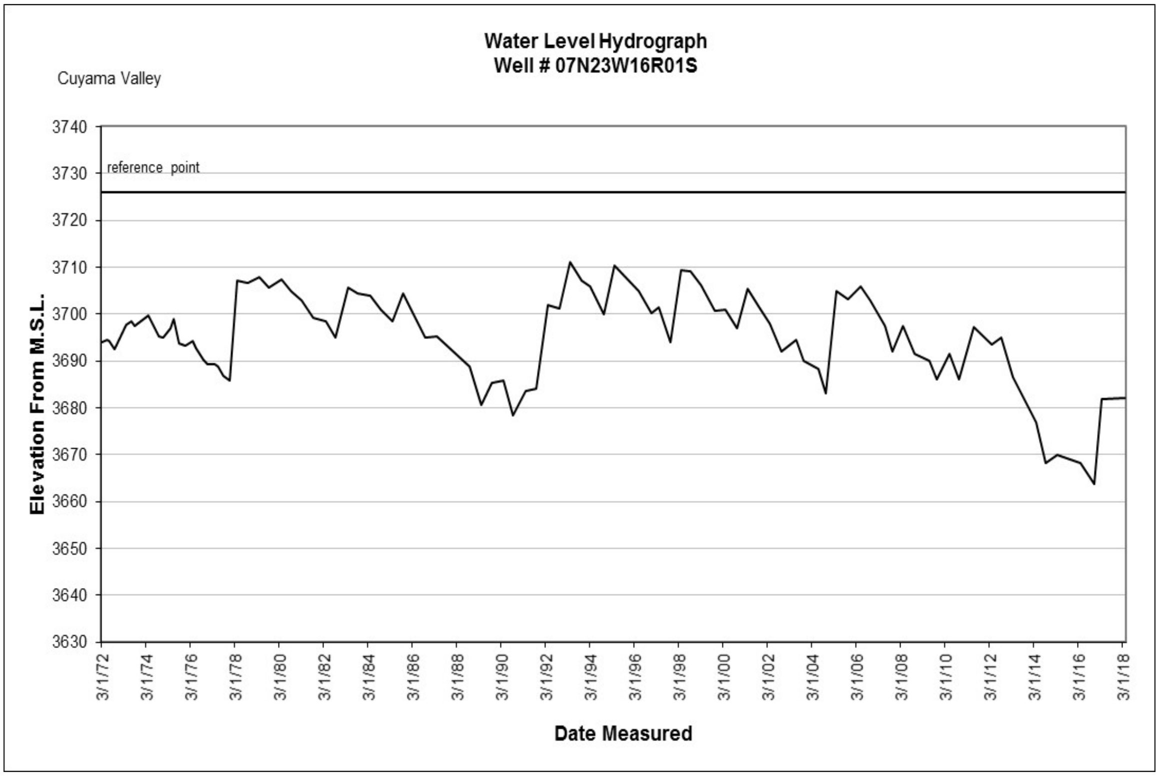

Figure B-32: Cuyama Valley Basin key well hydrograph.

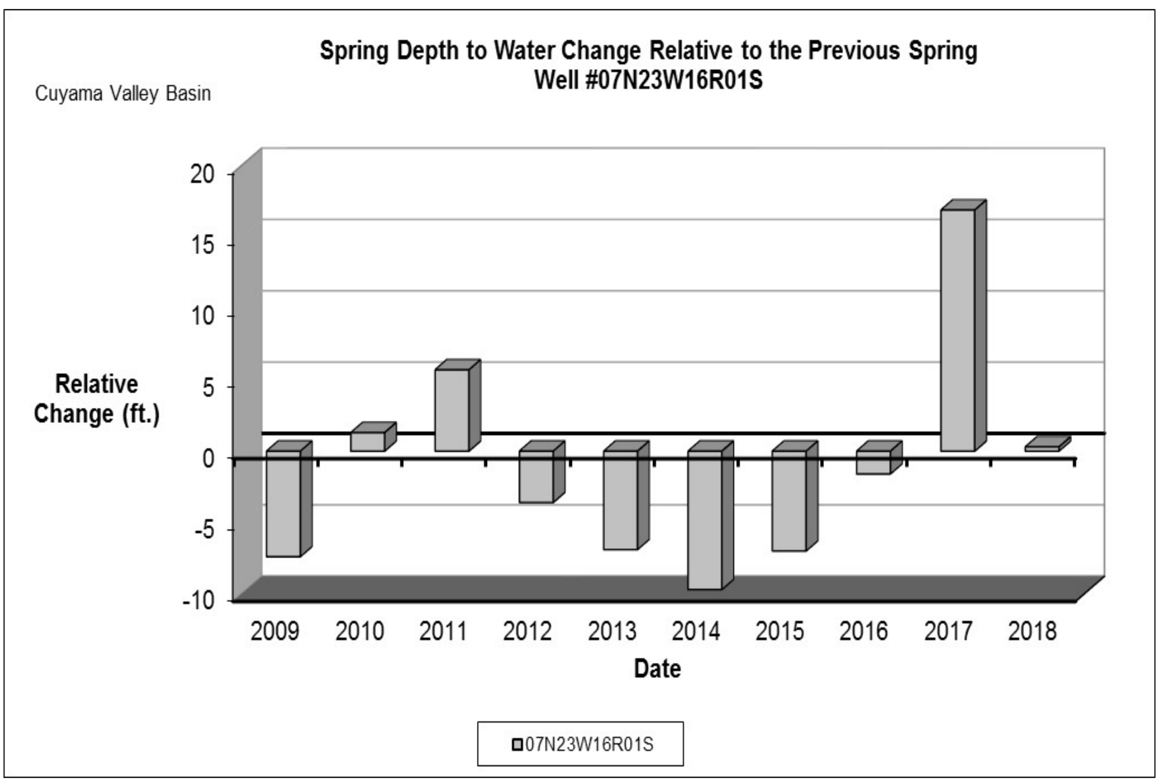

Figure B-33: Cuyama Valley Basin 10-year Spring level change Up/Down graph.

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Arroyo Santa Rosa Valley	02N19W20L01S	03/27/2018	307.66	----	----	no casing access for tape
		06/06/2018	307.66	----	----	no casing access for tape
		10/30/2018	307.66	----	----	Pumping
		12/24/2018	307.66	----	----	no casing access for tape
	02N20W23G01S	03/27/2018	370.80	285.30	85.50	
		06/06/2018	370.80	287.90	82.90	
		10/30/2018	370.80	293.50	77.30	
		12/24/2018	370.80	291.80	79.00	
	02N20W23K01S	03/27/2018	274.11	199.20	74.91	
		06/06/2018	274.11	213.40	60.71	
		10/30/2018	274.11	212.90	61.21	
		12/24/2018	274.11	204.60	69.51	
	02N20W23R01S	03/27/2018	235.21	100.60	134.61	
		06/06/2018	235.21	----	----	Pumping
		10/30/2018	235.21	----	----	Pumping
		12/24/2018	235.21	----	----	Pumping
	02N20W26B03S*	03/27/2018	205.87	66.17	139.70	
		06/06/2018	205.87	71.20	134.67	
		11/06/2018	205.87	75.90	129.97	
		12/24/2018	205.87	70.80	135.07	
Conejo	01N19W07K16S	03/06/2018	635.46	10.40	625.06	
		06/13/2018	635.46	8.90	626.56	
		09/25/2018	635.46	10.30	625.16	
		12/26/2018	635.46	9.30	626.16	
	01N20W03J01S	03/06/2018	764.40	48.70	715.70	
		06/13/2018	764.40	46.70	717.70	
		09/25/2018	764.40	50.80	713.60	
		12/26/2018	764.40	49.20	715.20	
Cuyama Valley	07N23W16R01S*	04/04/2018	3,726.00	43.80	3,682.20	
		09/27/2018	3,726.00	----	----	Could not measure this time.
	07N23W16R02S	04/04/2018	3,726.00	39.80	3,686.20	
		09/27/2018	3,726.00	----	----	Could not measure this time.
	07N24W13C03S	04/04/2018	3,435.00	31.10	3,403.90	
		09/27/2018	3,435.00	----	----	Could not measure this time.
	09N23W30E05S	04/04/2018	3,544.50	193.10	3,351.40	
		09/27/2018	3,544.50	----	----	Could not measure this time.
	09N24W33J03S	04/04/2018	3,130.00	162.20	2,967.80	
		09/27/2018	3,130.00	----	----	Could not measure this time.
Fillmore	03N19W06D02S	03/19/2018	434.60	79.55	355.05	
		06/04/2018	434.60	79.20	355.40	
		10/24/2018	434.60	84.00	350.60	
		12/05/2018	434.60	77.80	356.80	
	03N20W01C04S	03/19/2018	404.58	52.67	351.91	
		06/04/2018	404.58	49.30	355.28	
		10/24/2018	404.58	56.10	348.48	
		12/05/2018	404.58	59.60	344.98	

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Fillmore	03N20W05D01S*	03/19/2018	437.12	143.47	293.65	
		06/04/2018	437.12	148.68	288.44	
		11/07/2018	437.12	159.20	277.92	
		12/05/2018	437.12	----	----	meter would not stabilize
	03N20W09D01S	03/19/2018	325.20	17.00	308.20	
		06/04/2018	325.20	----	----	Pumping
		10/24/2018	325.20	----	----	Pumping
		12/05/2018	325.20	----	----	Pumping
	03N20W11C01S	03/19/2018	397.11	65.50	331.61	
		06/04/2018	397.11	62.05	335.06	
		10/24/2018	397.11	69.10	328.01	
		12/05/2018	397.11	68.40	328.71	
	03N21W01P02S	03/19/2018	301.85	----	----	Pumping
		06/04/2018	301.85	----	----	Pumping
		10/22/2018	301.85	54.00	247.85	
		12/05/2018	301.85	43.10	258.75	
	03N21W11B01S	03/19/2018	434.43	61.00	373.43	
		06/04/2018	434.43	----	----	Pumping
		10/22/2018	434.43	----	----	Pumping
		12/05/2018	434.43	67.10	367.33	
	04N19W30D01S	03/19/2018	448.85	82.18	366.67	
		06/04/2018	448.85	----	----	Pumping
		10/24/2018	448.85	86.50	362.35	
		12/05/2018	448.85	88.90	359.95	
	04N19W31R01S	03/19/2018	449.46	26.57	422.89	
		06/04/2018	449.46	----	----	Pumping
		10/24/2018	449.46	----	----	Could not measure this time.
		12/05/2018	449.46	----	----	Could not measure this time.
	04N19W32M02S	03/19/2018	477.43	8.42	469.01	
		06/04/2018	477.43	----	----	Pumping
		10/22/2018	477.43	11.10	466.33	
		12/14/2018	477.43	----	----	Pumping
	04N19W33D03S	03/19/2018	477.90	----	----	Pumping
		06/04/2018	477.90	----	----	Pumping
		10/22/2018	477.90	11.90	466.00	
		12/14/2018	477.90	12.00	465.90	
	04N20W23Q02S	03/19/2018	513.88	140.92	372.96	
		06/04/2018	513.88	140.58	373.30	
		11/07/2018	513.88	151.30	362.58	
		12/05/2018	513.88	155.30	358.58	
	04N20W26C02S	03/19/2018	505.35	146.88	358.47	
		06/04/2018	505.35	145.08	360.27	
		10/24/2018	505.35	161.00	344.35	
		12/05/2018	505.35	149.60	355.75	
	04N20W33C03S	03/19/2018	526.87	168.26	358.61	
		06/04/2018	526.87	----	----	Pumping
		10/22/2018	526.87	177.30	349.57	
		12/05/2018	526.87	----	----	gate locked

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Las Posas Valley – East Management Area	02N20W01M01S	03/08/2018	470.05	----	----	no way to measure well
		06/15/2018	470.05	----	----	no way to measure well
		10/17/2018	470.05	----	----	no way to measure well
		12/13/2018	470.05	----	----	no way to measure well
	02N20W03K03S	03/08/2018	485.50	----	----	owner won't allow access
		06/15/2018	485.50	----	----	owner won't allow access
		10/17/2018	485.50	----	----	owner won't allow access
		12/13/2018	485.50	----	----	owner won't allow access
	02N20W10D02S	03/07/2018	459.53	317.80	141.73	
		06/19/2018	459.53	329.40	130.13	
		10/17/2018	459.53	326.60	132.93	
		12/13/2018	459.53	330.40	129.13	
	02N20W10G01S	03/07/2018	415.47	181.00	234.47	
		06/19/2018	415.47	----	----	Pumping
		09/26/2018	415.47	----	----	Pumping
		12/13/2018	415.47	167.90	247.57	
	02N20W10J01S	03/07/2018	406.87	125.70	281.17	
		06/18/2018	406.87	125.60	281.27	
		09/26/2018	406.87	130.60	276.27	
		12/13/2018	406.87	129.40	277.47	
	03N19W17Q01S	04/10/2018	1,311.06	1,088.50	222.56	
		06/18/2018	1,311.06	----	----	Could not access well
		09/27/2018	1,311.06	----	----	Could not measure this time.
		12/31/2018	1,311.06	----	----	Could not measure this time.
	03N19W19J01S	03/08/2018	1,026.90	854.10	172.80	
		06/18/2018	1,026.90	854.30	172.60	
		09/27/2018	1,026.90	858.10	168.80	
		12/10/2018	1,026.90	859.30	167.60	
	03N19W19P02S	03/08/2018	1,057.94	----	----	airline kinked
		06/18/2018	1,057.94	----	----	airline kinked
		09/27/2018	1,057.94	----	----	airline kinked
		12/10/2018	1,057.94	----	----	airline kinked
	03N19W29F06S	03/08/2018	855.20	275.10	580.10	
		06/18/2018	855.20	281.40	573.80	
		09/27/2018	855.20	295.60	559.60	
		12/24/2018	855.20	284.60	570.60	
	03N19W29K04S	03/12/2018	843.32	----	----	meter won't read
		06/18/2018	843.32	----	----	meter won't read
		09/27/2018	843.32	----	----	meter won't read
		12/24/2018	843.32	----	----	meter won't read
	03N20W23L01S	03/08/2018	970.30	773.20	197.10	
		06/18/2018	970.30	774.30	196.00	
		10/16/2018	970.30	775.40	194.90	
		12/13/2018	970.30	772.70	197.60	
	03N20W25H01S	03/29/2018	823.84	219.70	604.14	
		06/18/2018	823.84	----	----	Pumping
		09/27/2018	823.84	----	----	Pumping
		12/10/2018	823.84	220.50	603.34	

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Las Posas Valley – East Management Area	03N20W26R03S*	03/09/2018	717.81	564.00	153.81	
		06/18/2018	717.81	578.20	139.61	
		09/27/2018	717.81	591.00	126.81	
		12/13/2018	717.81	580.10	137.71	
	03N20W27H03S	03/07/2018	840.25	641.60	198.65	
		06/18/2018	840.25	----	----	Pumping
		09/27/2018	840.25	645.30	194.95	
		12/10/2018	840.25	644.50	195.75	
	03N20W34G01S	03/08/2018	680.48	551.70	128.78	
		06/18/2018	680.48	552.30	128.18	
		09/27/2018	680.48	560.50	119.98	
		12/10/2018	680.48	558.40	122.08	
	03N20W35R02S	03/08/2018	572.67	----	----	meter would not stabilize
		06/18/2018	572.67	428.90	143.77	
		10/16/2018	572.67	442.10	130.57	
		12/27/2018	572.67	432.50	140.17	
	03N20W35R03S	03/08/2018	572.67	----	----	meter would not stabilize
		06/18/2018	572.67	----	----	meter would not stabilize
		10/16/2018	572.67	----	----	meter would not stabilize
		12/27/2018	572.67	----	----	could not access casing
	03N20W35R04S	03/08/2018	572.67	----	----	meter would not stabilize
		06/18/2018	572.67	----	----	meter would not stabilize
		10/16/2018	572.67	----	----	meter would not stabilize
		12/27/2018	572.67	----	----	could not access casing
Las Posas Valley – East Management Area	02N19W05K01S*	03/12/2018	497.80	22.60	475.20	
		06/18/2018	497.80	29.90	467.90	
		09/27/2018	497.80	----	----	Could not measure this time.
		12/27/2018	497.80	30.40	467.40	
	02N19W08H02S	03/12/2018	494.87	25.40	469.47	
		06/18/2018	494.87	----	----	Could not access well
		09/27/2018	494.87	----	----	Could not measure this time.
		12/27/2018	494.87	26.10	468.77	
Las Posas Valley – West Management Area	02N20W05D01S	03/29/2018	569.00	699.28	-130.28	
		06/08/2018	569.00	701.20	-132.20	
		09/27/2018	569.00	----	----	Could not measure this time.
		12/31/2018	569.00	----	----	Could not measure this time.
	02N20W06R01S	03/07/2018	461.19	595.70	-134.51	
		06/18/2018	461.19	597.20	-136.01	
		09/27/2018	461.19	----	----	Pumping
		12/10/2018	461.19	626.70	-165.51	
	02N20W07R03S	03/08/2018	395.00	544.40	-149.40	
		06/18/2018	395.00	----	----	Pumping
		10/17/2018	395.00	542.60	-147.60	
		12/13/2018	395.00	540.30	-145.30	
	02N21W08H03S	03/12/2018	334.21	426.60	-92.39	
		06/18/2018	334.21	429.40	-95.19	
		09/26/2018	334.21	----	----	Could not measure this time.
		12/31/2018	334.21	----	----	Could not measure this time.

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Las Posas Valley – West Management Area	02N21W09D02S	03/05/2018	323.75	247.90	75.85	
		06/26/2018	323.75	256.80	66.95	
		09/27/2018	323.75	266.10	57.65	
		12/10/2018	323.75	256.80	66.95	
	02N21W10G03S	03/07/2018	381.01	418.60	-37.59	
		06/19/2018	381.01	----	----	Pumping
		09/27/2018	381.01	----	----	Pumping
		12/10/2018	381.01	412.10	-31.09	
	02N21W11J03S	03/07/2018	379.39	443.40	-64.01	
		06/19/2018	379.39	443.20	-63.81	
		10/17/2018	379.39	452.40	-73.01	
		12/24/2018	379.39	442.30	-62.91	
	02N21W11J04S	03/07/2018	379.39	405.70	-26.31	
		06/19/2018	379.39	407.40	-28.01	
		10/17/2018	379.39	410.90	-31.51	
		12/24/2018	379.39	409.40	-30.01	
	02N21W11J05S	03/07/2018	379.39	218.60	160.79	
		06/19/2018	379.39	218.50	160.89	
		10/17/2018	379.39	223.70	155.69	
		12/24/2018	379.39	222.00	157.39	
	02N21W11J06S	03/07/2018	379.39	185.20	194.19	
		06/19/2018	379.39	183.90	195.49	
		10/17/2018	379.39	186.30	193.09	
		12/24/2018	379.39	186.70	192.69	
	02N21W12H01S*	03/26/2018	417.89	461.42	-43.53	
		06/08/2018	417.89	468.80	-50.91	
		10/17/2018	417.89	----	----	Pumping
		12/31/2018	417.89	----	----	Could not measure this time.
	02N21W15M03S	03/06/2018	263.87	329.40	-65.53	
		06/15/2018	263.87	330.90	-67.03	
		10/17/2018	263.87	----	----	Could not measure this time.
		12/10/2018	263.87	325.70	-61.83	
	02N21W16J01S	03/06/2018	259.90	16.70	243.20	
		06/15/2018	259.90	17.10	242.80	
		09/27/2018	259.90	17.90	242.00	
		12/10/2018	259.90	17.10	242.80	
	03N20W32H03S	03/12/2018	673.00	881.50	-208.50	
		06/18/2018	673.00	----	----	Pumping
		10/16/2018	673.00	886.10	-213.10	
		12/10/2018	673.00	----	----	air gage would not stabilize
	03N21W35P02S	03/06/2018	564.11	523.20	40.91	
		06/15/2018	564.11	530.00	34.11	
		09/27/2018	564.11	525.00	39.11	
		12/10/2018	564.11	519.50	44.61	
Cuddy Ranch Area	08N20W08B01S	04/04/2018	5,300.00	12.40	5,287.60	
		12/31/2018	5,300.00	----	----	Could not measure this time.

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** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	Elev.**	Notes
Lockwood Valley	08N21W33R03S*	04/04/2018	5,150.00	53.80	5,096.20	
		12/31/2018	5,150.00	----	----	Could not measure this time.
	08N21W35B01S	04/04/2018	5,029.20	----	----	water level below collapsed section
		12/31/2018	5,029.20	----	----	water level below collapsed section
	08N21W36G02S	04/04/2018	4,922.00	32.90	4,889.10	
		12/31/2018	4,922.00	----	----	Could not measure this time.
Mound	02N22W08P01S	03/20/2018	213.79	----	----	Liner installed above perfs - no water
		06/05/2018	213.79	----	----	Liner installed above perfs - no water
		10/25/2018	213.79	----	----	Liner installed above perfs - no water
		12/13/2018	213.79	----	----	Liner installed above perfs - no water
	02N22W09L03S	03/20/2018	251.25	----	----	fence locked
		06/05/2018	251.25	----	----	fence locked
		10/25/2018	251.25	202.20	49.05	
		12/13/2018	251.25	200.40	50.85	
	02N22W09L04S	03/20/2018	251.25	----	----	fence locked
		06/05/2018	251.25	----	----	fence locked
		10/25/2018	251.25	183.80	67.45	
		12/13/2018	251.25	182.90	68.35	
	02N22W16K01S	03/19/2018	149.37	187.65	-38.28	
		06/04/2018	149.37	188.80	-39.43	
		10/25/2018	149.37	196.30	-46.93	
		12/13/2018	149.37	194.70	-45.33	
	02N23W13K03S	03/20/2018	68.71	71.50	-2.79	
		06/05/2018	68.71	78.20	-9.49	
		10/25/2018	68.71	87.60	-18.89	
		12/26/2018	68.71	----	----	Pumping
Ojai Valley	04N22W04Q01S	03/14/2018	1,045.50	121.70	923.80	
		06/14/2018	1,045.50	94.80	950.70	
		09/20/2018	1,045.50	----	----	Pumping
		12/11/2018	1,045.50	103.80	941.70	
	04N22W05D03S	03/01/2018	895.97	217.30	678.67	
		06/12/2018	895.97	201.10	694.87	
		09/20/2018	895.97	----	----	Could not measure this time.
		12/11/2018	895.97	231.10	664.87	
	04N22W05H04S	03/01/2018	950.22	248.10	702.12	
		06/12/2018	950.22	244.70	705.52	
		09/20/2018	950.22	----	----	Could not measure this time.
		12/11/2018	950.22	256.20	694.02	
	04N22W05L08S*	03/01/2018	892.09	203.10	688.99	
		06/12/2018	892.09	197.70	694.39	
		09/20/2018	892.09	----	----	Pumping
		12/11/2018	892.09	213.00	679.09	
	04N22W05M01S	03/01/2018	843.47	169.00	674.47	
		06/12/2018	843.47	159.10	684.37	
		09/20/2018	843.47	186.10	657.37	
		12/11/2018	843.47	192.30	651.17	

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*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Ojai Valley	04N22W06D01S	03/01/2018	846.66	134.20	712.46	
		06/11/2018	846.66	128.00	718.66	
		09/19/2018	846.66	134.60	712.06	
		12/11/2018	846.66	139.50	707.16	
	04N22W06D05S	03/01/2018	853.21	154.20	699.01	
		06/12/2018	853.21	144.10	709.11	
		09/20/2018	853.21	152.20	701.01	
		12/11/2018	853.21	155.30	697.91	
	04N22W06K03S	03/09/2018	801.80	164.20	637.60	
		06/11/2018	801.80	----	----	Pumping
		09/20/2018	801.8	----	----	Pumping
		12/05/2018	801.80	160.90	640.90	
	04N22W06K12S	03/01/2018	812.70	170.90	641.80	
		06/11/2018	812.70	147.80	664.90	
		09/20/2018	812.70	177.10	635.60	
		12/11/2018	812.70	164.40	648.30	
	04N22W06M01S	03/01/2018	794.78	92.40	702.38	
		06/11/2018	794.78	92.40	702.38	
		09/19/2018	794.78	93.30	701.48	
		12/11/2018	794.78	94.10	700.68	
	04N22W07B02S	03/01/2018	773.77	125.90	647.87	
		06/11/2018	773.77	121.70	652.07	
		09/19/2018	773.77	130.10	643.67	
		12/28/2018	773.77	112.70	661.07	
	04N22W07G01S	03/01/2018	771.20	36.90	734.30	
		06/11/2018	771.20	37.70	733.50	
		09/19/2018	771.20	39.20	732.00	
		12/28/2018	771.20	41.20	730.00	
	04N22W08B02S	03/01/2018	870.57	174.10	696.47	
		06/14/2018	870.57	174.60	695.97	
		09/19/2018	870.57	184.80	685.77	
		12/11/2018	870.57	187.40	683.17	
	04N23W01K02S	03/01/2018	786.38	54.90	731.48	
		06/11/2018	786.38	52.20	734.18	
		09/19/2018	786.38	58.90	727.48	
		12/04/2018	786.38	70.50	715.88	
	04N23W02K01S	03/01/2018	869.49	----	----	could not get a hold of owner this time
		06/14/2018	869.49	1.50	867.99	
		09/19/2018	869.49	2.20	867.29	
		12/04/2018	869.49	----	----	Could not measure this time.
	04N23W12H02S	03/12/2018	716.61	47.80	668.81	
		06/14/2018	716.61	45.00	671.61	
		09/20/2018	716.61	48.20	668.41	
		12/28/2018	716.61	----	----	Could not measure this time.

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Ojai Valley	04N23W12L02S	03/05/2018	682.50	----	----	Owner will not allow access
		06/14/2018	682.50	----	----	Owner will not allow access
		09/19/2018	682.50	----	----	Owner will not allow access
		12/04/2018	682.50	----	----	Owner will not allow access
	05N22W32J02S	03/01/2018	1,139.80	57.10	1,082.70	
		06/12/2018	1,139.80	56.20	1,083.60	
		09/19/2018	1,139.80	57.80	1,082.00	
		12/11/2018	1,139.80	54.90	1,084.90	
Oxnard – Forebay Management Area	02N21W07P04S	03/06/2018	138.78	----	----	access port blocked
		06/15/2018	138.78	----	----	access port blocked
		10/17/2018	138.78	----	----	Could not measure this time.
		12/31/2018	138.78	----	----	Could not measure this time.
	02N22W26E01S	03/27/2018	86.96	115.80	-28.84	
		06/04/2018	86.96	117.76	-30.80	
		10/25/2018	86.96	----	----	Could not measure this time.
		12/31/2018	86.96	----	----	Could not measure this time.
Oxnard	01N21W04N02S	03/20/2018	43.33	140.10	-96.77	
		06/06/2018	43.33	143.90	-100.57	
		11/02/2018	43.33	180.80	-137.47	
		12/20/2018	43.33	148.10	-104.77	
	01N21W06L04S	03/26/2018	47.85	71.20	-23.35	
		06/05/2018	47.85	75.75	-27.90	
		11/01/2018	47.85	----	----	locked - no key
		12/31/2018	47.85	----	----	locked - no key
	01N21W07H01S*	03/20/2018	40.87	57.04	-16.17	
		06/05/2018	40.87	63.67	-22.80	
		11/01/2018	40.87	68.50	-27.63	
		12/20/2018	40.87	64.10	-23.23	
	01N21W08N03S	03/20/2018	31.50	118.55	-87.05	
		06/05/2018	31.50	128.08	-96.58	
		10/31/2018	31.50	----	----	Pumping
		12/31/2018	31.50	----	----	Could not measure this time.
	01N21W09C04S	03/20/2018	39.96	133.00	-93.04	
		06/06/2018	39.96	135.43	-95.47	
		11/02/2018	39.96	174.70	-134.74	
		12/24/2018	39.96	137.90	-97.94	
	01N21W16M01S	03/20/2018	22.79	113.08	-90.29	
		06/05/2018	22.79	124.75	-101.96	
		10/31/2018	22.79	163.60	-140.81	
		12/26/2018	22.79	119.20	-96.41	
	01N21W16P03S	03/20/2018	19.39	113.20	-93.81	
		06/05/2018	19.39	126.33	-106.94	
		10/31/2018	19.39	162.40	-143.01	
		12/26/2018	19.39	115.70	-96.31	

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** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Oxnard	01N21W17D02S	03/20/2018	28.21	46.50	-18.29	
		06/05/2018	28.21	50.18	-21.97	
		10/31/2018	28.21	57.00	-28.79	
		12/20/2018	28.21	50.80	-22.59	
	01N21W20N07S	03/20/2018	16.98	----	----	locked - no key
		06/05/2018	16.98	----	----	locked - no key
		10/31/2018	16.98	----	----	locked - no key
		12/31/2018	16.98	----	----	locked - no key
	01N21W21N01S	03/20/2018	15.74	----	----	locked gate - no key
		06/05/2018	15.74	86.32	-70.58	
		10/31/2018	15.74	----	----	Pumping
		12/19/2018	15.74	----	----	Pumping
	01N21W28D01S	03/20/2018	14.75	93.49	-78.74	
		06/05/2018	14.75	103.77	-89.02	
		11/08/2018	14.75	140.70	-125.95	
		12/19/2018	14.75	107.00	-92.25	
	01N21W29B03S	03/20/2018	18.19	----	----	Pumping
		06/05/2018	18.19	----	----	Pumping
		10/31/2018	18.19	39.80	-21.61	
		12/26/2018	18.19	----	----	Pumping
	01N21W32K01S*	03/12/2018	10.00	87.00	-77.00	
		07/16/2018	10.00	90.70	-80.70	
		10/15/2018	10.00	110.70	-100.70	
		12/17/2018	10.00	93.40	-83.40	
	01N22W12N03S	03/26/2018	38.46	----	----	locked gate - no key
		06/06/2018	38.46	127.60	-89.14	
		11/01/2018	38.46	----	----	locked gate - no key
		12/31/2018	38.46	----	----	locked gate - no key
	01N22W12R01S	03/26/2018	34.00	95.83	-61.83	
		06/05/2018	34.00	108.25	-74.25	
		11/02/2018	34.00	----	----	Irrigating road impassable
		12/31/2018	34.00	----	----	Could not measure this time.
	01N22W14K01S	03/20/2018	33.97	----	----	can't get tape past 50 feet
		06/05/2018	33.97	----	----	can't get tape past 50 feet
		10/29/2018	33.97	----	----	can't get tape past 50 feet
		12/20/2018	33.97	----	----	can't get tape past 50 feet
	01N22W21B03S	03/20/2018	15.28	51.85	-36.57	
		06/05/2018	15.28	55.65	-40.37	
		10/31/2018	15.28	61.70	-46.42	
		12/19/2018	15.28	57.10	-41.82	
	01N22W24C02S	03/20/2018	29.10	46.72	-17.62	
		06/05/2018	29.10	42.84	-13.74	
		10/31/2018	29.10	49.50	-20.40	
		12/19/2018	29.10	45.50	-16.40	
	01N22W26K03S	03/20/2018	13.06	73.42	-60.36	
		06/05/2018	13.06	92.20	-79.14	
		10/29/2018	13.06	109.80	-96.74	
		12/19/2018	13.06	81.70	-68.64	

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*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Oxnard	01N22W26M03S	03/20/2018	13.00	72.00	-59.00	
		06/05/2018	13.00	87.17	-74.17	
		10/29/2018	13.00	96.10	-83.10	
		12/19/2018	13.00	77.40	-64.40	
	01N22W36B02S	03/20/2018	11.50	----	----	road closed
		06/05/2018	11.50	88.50	-77.00	
		10/31/2018	11.50	----	----	Pumping
		12/19/2018	11.50	----	----	Pumping
	02N21W18H03S	03/26/2018	118.41	121.30	-2.89	
		06/11/2018	118.41	124.50	-6.09	
		11/05/2018	118.41	133.00	-14.59	
		12/24/2018	118.41	123.00	-4.59	
	02N21W18H12S	03/26/2018	117.88	171.50	-53.62	
		06/11/2018	117.88	189.50	-71.62	
		11/05/2018	117.88	196.90	-79.02	
		12/24/2018	117.88	182.40	-64.52	
	02N21W19A03S	03/07/2018	102.70	153.30	-50.60	
		06/15/2018	102.70	160.60	-57.90	
		09/26/2018	102.70	153.80	-51.10	
		12/10/2018	102.70	157.10	-54.40	
	02N21W19B02S	03/26/2018	101.80	121.02	-19.22	
		06/07/2018	101.80	126.08	-24.28	
		10/31/2018	101.80	124.10	-22.30	
		12/13/2018	101.80	127.10	-25.30	
	02N21W20F02S	03/07/2018	113.36	201.50	-88.14	
		06/15/2018	113.36	204.20	-90.84	
		11/05/2018	113.36	203.80	-90.44	
		12/10/2018	113.36	196.80	-83.44	
	02N21W20M06S	03/26/2018	92.09	----	----	Pumping
		06/07/2018	92.09	193.60	-101.51	
		10/30/2018	92.09	199.80	-107.71	
		12/17/2018	92.09	190.50	-98.41	
	02N21W31P02S	03/26/2018	57.75	80.00	-22.25	
		06/05/2018	57.75	82.75	-25.00	
		11/01/2018	57.75	86.50	-28.75	
		12/20/2018	57.75	87.10	-29.35	
	02N21W31P03S	03/26/2018	55.17	134.67	-79.50	
		06/05/2018	55.17	148.83	-93.66	
		11/01/2018	55.17	145.70	-90.53	
		12/20/2018	55.17	153.00	-97.83	
	02N22W24P01S	03/26/2018	94.30	129.80	-35.50	
		06/07/2018	94.30	----	----	Pumping
		10/31/2018	94.30	----	----	Pumping
		12/13/2018	94.30	----	----	Pumping
	02N22W30K01S	03/20/2018	42.38	69.83	-27.45	
		06/05/2018	42.38	75.70	-33.32	
		10/29/2018	42.38	78.70	-36.32	
		12/18/2018	42.38	77.20	-34.82	

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Oxnard	02N22W31A01S	03/20/2018	42.30	67.55	-25.25	
		06/05/2018	42.30	72.10	-29.80	
		10/29/2018	42.30	75.00	-32.70	
		12/19/2018	42.30	73.00	-30.70	
	02N22W32Q03S	03/20/2018	40.10	67.40	-27.30	
		06/05/2018	40.10	----	----	new fence-new lock
		10/29/2018	40.10	----	----	new fence-new lock
		12/19/2018	40.10	----	----	new fence-new lock
	02N23W25G02S	03/20/2018	23.22	----	----	locked - no key
		06/05/2018	23.22	----	----	locked - no key
		10/29/2018	23.22	----	----	locked - no key
		12/18/2018	23.22	----	----	locked - no key
	02N23W36C04S	03/20/2018	27.73	54.43	-26.70	
		06/05/2018	27.73	54.70	-26.97	
		10/29/2018	27.73	55.40	-27.67	
		12/18/2018	27.73	55.70	-27.97	
Piru	04N18W19R01S	03/19/2018	655.63	132.33	523.30	
		06/04/2018	655.63	134.74	520.89	
		10/22/2018	655.63	----	----	Pumping
		12/14/2018	655.63	147.80	507.83	
	04N18W20R01S	03/19/2018	661.29	----	----	locked - no key
		06/04/2018	661.29	----	----	locked - no key
		10/22/2018	661.29	----	----	locked - no key
		12/31/2018	661.29	----	----	locked - no key
	04N18W28C02S	03/19/2018	676.44	----	----	can't get tape in casing
		06/04/2018	676.44	----	----	Pumping
		10/22/2018	676.44	----	----	Could not measure this time.
		12/31/2018	676.44	----	----	Could not measure this time.
	04N18W30J05S	03/19/2018	623.30	93.07	530.23	
		06/04/2018	623.30	94.75	528.55	
		10/22/2018	623.30	105.40	517.90	
		12/14/2018	623.30	107.10	516.20	
	04N19W25C02S*	03/19/2018	611.09	100.10	510.99	
		06/04/2018	611.09	103.08	508.01	
		10/22/2018	611.09	111.30	499.79	
		12/14/2018	611.09	112.40	498.69	
	04N19W25K04S	03/19/2018	593.97	46.67	547.30	
		06/04/2018	593.97	----	----	Pumping
		10/22/2018	593.97	46.70	547.27	
		12/14/2018	593.97	48.20	545.77	
	04N19W26P01S	03/19/2018	563.00	61.60	501.40	
		06/04/2018	563.00	----	----	Pumping
		10/22/2018	563.00	----	----	Pumping
		12/14/2018	563.00	71.10	491.90	
	04N19W34K01S	03/19/2018	519.51	30.25	489.26	
		06/04/2018	519.51	30.75	488.76	
		10/24/2018	519.51	37.10	482.41	
		12/14/2018	519.51	----	----	Pumping
	04N19W35L02S	03/19/2018	541.08	45.25	495.83	
		06/04/2018	541.08	45.15	495.93	
		10/24/2018	541.08	49.00	492.08	
		12/31/2018	541.08	----	----	Could not measure this time.

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** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Pleasant Valley	01N21W01M02S	03/20/2018	96.17	187.21	-91.04	
		06/05/2018	96.17	195.90	-99.73	
		11/08/2018	96.17	----	----	Pumping
		12/20/2018	96.17	----	----	Pumping
	01N21W02J02S	03/26/2018	89.51	89.70	-0.19	
		06/06/2018	89.51	91.28	-1.77	
		11/02/2018	89.51	121.20	-31.69	
		12/20/2018	89.51	104.10	-14.59	
	01N21W02P01S	03/20/2018	67.98	127.80	-59.82	
		06/05/2018	67.98	125.42	-57.44	
		11/02/2018	67.98	157.10	-89.12	
		12/19/2018	67.98	141.60	-73.62	
	01N21W03C01S*	03/26/2018	72.28	162.30	-90.02	
		06/05/2018	72.28	165.20	-92.92	
		11/05/2018	72.28	180.90	-108.62	
		12/24/2018	72.28	167.60	-95.32	
	01N21W04K01S	03/20/2018	47.52	139.80	-92.28	
		06/06/2018	47.52	144.05	-96.53	
		11/05/2018	47.52	----	----	Could not measure this time.
		12/20/2018	47.52	115.20	-67.68	
	01N21W09J03S	03/28/2018	30.56	115.60	-85.04	
		06/11/2018	30.56	126.80	-96.24	
		11/02/2018	30.56	167.00	-136.44	
		12/24/2018	30.56	131.50	-100.94	
	01N21W10G01S	03/20/2018	38.72	125.26	-86.54	
		06/05/2018	38.72	132.32	-93.60	
		11/02/2018	38.72	----	----	Could not measure this time.
		12/20/2018	38.72	131.10	-92.38	
	01N21W14A01S	03/20/2018	50.11	23.67	26.44	
		06/05/2018	50.11	24.09	26.02	
		11/02/2018	50.11	26.40	23.71	
		12/19/2018	50.11	26.50	23.61	
	01N21W15H01S	03/20/2018	33.17	17.20	15.97	
		06/05/2018	33.17	16.65	16.52	
		11/01/2018	33.17	20.80	12.37	
		12/19/2018	33.17	20.00	13.17	
	01N21W16A04S	03/20/2018	25.69	----	----	Pumping
		06/06/2018	25.69	----	----	Pumping
		11/01/2018	25.69	162.10	-136.41	
		12/19/2018	25.69	122.00	-96.31	
	02N20W19M05S	03/26/2018	200.47	189.17	11.30	
		06/07/2018	200.47	196.40	4.07	
		11/06/2018	200.47	203.60	-3.13	
		12/27/2018	200.47	198.80	1.67	
	01N21W01M02S	03/20/2018	96.17	187.21	-91.04	
		06/05/2018	96.17	195.90	-99.73	
		11/08/2018	96.17	----	----	Pumping
		12/20/2018	96.17	----	----	Pumping

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*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Pleasant Valley	02N21W33P02S	03/27/2018	64.63	----	----	new gate across road - locked no key
		06/05/2018	64.63	----	----	new gate across road - locked no key
		11/05/2018	64.63	----	----	new gate across road - locked no key
		12/31/2018	64.63	----	----	new gate across road - locked no key
	02N21W35M02S	03/26/2018	90.60	178.70	-88.10	
		06/06/2018	90.60	185.20	-94.60	
		11/05/2018	90.60	208.80	-118.20	
		12/20/2018	90.60	186.50	-95.90	
	02N21W36N01S	03/26/2018	111.18	112.70	-1.52	
		06/06/2018	111.18	103.08	8.10	
		11/05/2018	111.18	116.10	-4.92	
		12/20/2018	111.18	113.10	-1.92	
Santa Paula	02N22W02C01S*	03/19/2018	184.38	52.68	131.70	
		06/04/2018	184.38	53.28	131.10	
		10/23/2018	184.38	58.90	125.48	
		12/05/2018	184.38	56.00	128.38	
	02N22W03K02S	03/20/2018	248.75	----	----	Pumping
		06/06/2018	248.75	----	----	Pumping
		10/23/2018	248.75	----	----	Pumping
		12/05/2018	248.75	----	----	Pumping
	02N22W03M02S	03/20/2018	291.50	215.17	76.33	
		06/06/2018	291.50	213.70	77.80	
		10/23/2018	291.50	216.90	74.60	
		12/13/2018	291.50	218.40	73.10	
	03N21W09K02S	03/19/2018	362.18	180.26	181.92	
		06/04/2018	362.18	182.00	180.18	
		10/23/2018	362.18	191.90	170.28	
		12/05/2018	362.18	183.30	178.88	
	03N21W17Q01S	03/19/2018	283.35	108.45	174.90	
		06/04/2018	283.35	109.20	174.15	
		10/23/2018	283.35	----	----	Pumping
		12/31/2018	283.35	----	----	Could not measure this time.
	03N21W19R01S	03/19/2018	235.39	83.05	152.34	
		06/04/2018	235.39	----	----	Bees
		10/23/2018	235.39	85.20	150.19	
		12/05/2018	235.39	85.30	150.09	
	03N21W30F01S	03/19/2018	221.21	----	----	Pumping
		06/04/2018	221.21	79.83	141.38	
		10/23/2018	221.21	85.80	135.41	
		12/05/2018	221.21	81.40	139.81	
	03N22W36K05S	03/19/2018	180.89	49.85	131.04	
		06/04/2018	180.89	48.25	132.64	
		10/23/2018	180.89	49.70	131.19	
		12/13/2018	180.89	49.90	130.99	

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*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Hidden Valley	01N19W19L02S	03/06/2018	1,082.00	322.90	759.10	
		06/13/2018	1,082.00	327.60	754.40	
		09/25/2018	1,082.00	----	----	Pumping
		12/26/2018	1,082.00	325.30	756.70	
	01N19W30A01S	03/06/2018	999.98	51.80	948.18	
		06/13/2018	999.98	53.50	946.48	
		09/25/2018	999.98	56.60	943.38	
		12/26/2018	999.98	57.20	942.78	
Simi Valley	02N18W04R02S	03/27/2018	870.00	54.00	816.00	
		06/06/2018	870.00	54.80	815.20	
		10/30/2018	870.00	52.40	817.60	
		12/12/2018	870.00	54.70	815.30	
	02N18W10A02S	03/23/2018	926.40	89.10	837.30	
		06/22/2018	926.40	90.70	835.70	
		09/28/2018	926.40	81.40	845.00	
		12/12/2018	926.40	----	----	Pumping
Thousand Oaks Area	01N19W14K04S	03/06/2018	908.79	24.50	884.29	
		06/13/2018	908.79	23.70	885.10	
		09/25/2018	908.79	25.00	883.79	
		12/26/2018	908.79	24.80	883.99	
Tierra Rejada Valley	02N19W10R01S	03/27/2018	619.29	144.18	475.11	
		06/06/2018	619.29	147.15	472.14	
		10/30/2018	619.29	----	----	Pumping
		12/24/2018	619.29	----	----	Pumping
	02N19W12M03S	03/27/2018	718.95	99.52	619.43	
		06/06/2018	718.95	----	----	Pumping
		10/30/2018	718.95	----	----	Pumping
		12/24/2018	718.95	100.10	618.85	
	02N19W14P01S	03/27/2018	678.12	33.32	644.80	
		06/06/2018	678.12	----	----	Pumping
		10/30/2018	678.12	----	----	Pumping
		12/24/2018	678.12	38.50	639.62	
U N D E F I N E D	01N19W02L01S	03/06/2018	945.42	48.60	896.82	
		06/13/2018	945.42	48.20	897.22	
		09/25/2018	945.42	49.40	896.02	
		12/26/2018	945.42	50.30	895.12	
	01N19W15E01S	03/06/2018	903.53	26.40	877.13	
		06/13/2018	903.53	25.40	878.13	
		09/25/2018	903.53	27.80	875.73	
		12/26/2018	903.53	27.60	875.93	
	01N20W24H02S	03/06/2018	1,126.54	----	----	too much rust
		06/13/2018	1,126.54	----	----	too much rust
		09/25/2018	1,126.54	----	----	too much rust
		12/26/2018	1,126.54	----	----	too much rust
	02N20W18A01S	03/08/2018	375.60	508.20	-132.60	
		06/19/2018	375.60	510.20	-134.60	
		10/17/2018	375.60	516.90	-141.30	
		12/13/2018	375.60	513.00	-137.40	
	02N21W13A01S	03/08/2018	440.00	561.40	-121.40	
		06/18/2018	440.00	----	----	pressure would not hold
		10/17/2018	440.00	----	----	Could not measure this time.
		12/31/2018	440.00	----	----	Could not measure this time.

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** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Upper Ojai Valley	04N22W09Q02S	03/13/2018	1,278.80	----	----	measure port blocked
		06/12/2018	1,278.80	----	----	measure port blocked
		09/20/2018	1,278.80	----	----	measure port blocked
		12/11/2018	1,278.80	----	----	measure port blocked
	04N22W10K02S	03/13/2018	1,325.90	24.40	1,301.50	
		06/12/2018	1,325.90	20.40	1,305.50	
		09/18/2018	1,325.90	24.70	1,301.20	
		12/11/2018	1,325.90	24.80	1,301.10	
	04N22W11P02S	03/13/2018	1,420.60	24.80	1,395.80	
		06/12/2018	1,420.60	23.20	1,397.40	
		09/18/2018	1,420.60	28.50	1,392.10	
		12/11/2018	1,420.60	29.00	1,391.60	
	04N22W12F04S	03/12/2018	1,616.90	24.60	1,592.30	
		06/12/2018	1,616.90	114.60	1,502.30	
		09/18/2018	1,616.90	----	----	Pumping
		12/11/2018	1,616.90	151.20	1,465.70	
Ventura River - Lower	03N23W08B07S	03/15/2018	239.19	18.70	220.49	
		06/11/2018	239.19	15.60	223.59	
		09/18/2018	239.19	15.10	224.09	
		12/03/2018	239.19	14.20	224.99	
	03N23W32Q03S	03/08/2018	50.86	33.20	17.66	
		06/15/2018	50.86	35.90	14.96	
		09/18/2018	50.86	----	----	Could not measure this time.
		12/11/2018	50.86	----	----	Could not get onto property.
	03N23W32Q07S	03/08/2018	46.10	24.80	21.30	
		06/15/2018	46.10	30.80	15.30	
		09/18/2018	46.10	----	----	Could not measure this time.
		12/11/2018	46.10	----	----	Could not get onto property.
Ventura River - Upper	03N23W05B01S	03/14/2018	293.20	48.10	245.10	
		06/11/2018	293.20	45.30	247.90	
		09/18/2018	293.20	46.30	246.90	
		12/03/2018	293.20	47.00	246.20	
	04N23W03M01S	03/05/2018	760.85	103.40	657.45	
		06/12/2018	760.85	102.60	658.25	
		09/17/2018	760.85	103.40	657.45	
		12/04/2018	760.85	104.20	656.65	
	04N23W04J01S	03/05/2018	713.04	70.30	642.74	
		06/12/2018	713.04	68.10	644.94	
		09/17/2018	713.04	68.90	644.14	
		12/28/2018	713.04	67.80	645.24	
	04N22W09Q02S	03/13/2018	1,278.80	----	----	measure port blocked
		06/12/2018	1,278.80	----	----	measure port blocked
		09/20/2018	1,278.80	----	----	measure port blocked
		12/11/2018	1,278.80	----	----	measure port blocked

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*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Ventura River - Upper	04N23W09B01S	03/05/2018	662.30	63.80	598.50	
		06/12/2018	662.30	51.70	610.60	
		09/17/2018	662.30	60.00	602.30	
		12/28/2018	662.30	47.60	614.70	
	04N23W14M04S	03/14/2018	554.50	----	----	Flowing
		06/14/2018	554.50	----	----	Flowing
		09/17/2018	554.50	----	----	Flowing
		12/28/2018	554.50	----	----	Flowing
	04N23W15A02S	03/14/2018	680.90	96.10	584.80	
		06/11/2018	680.90	94.90	586.00	
		09/19/2018	680.90	----	----	Pumping
		12/04/2018	680.90	----	----	Pumping
	04N23W15D02S	03/05/2018	634.30	140.90	493.40	
		06/11/2018	634.30	142.10	492.20	
		09/17/2018	634.30	147.00	487.30	
		12/04/2018	634.30	157.00	477.30	
	04N23W16C04S	03/05/2018	569.10	68.90	500.20	
		06/14/2018	569.10	65.10	504.00	
		09/17/2018	569.10	73.80	495.30	
		12/31/2018	569.10	81.70	487.40	
	04N23W16P01S	03/05/2018	619.89	72.40	547.49	
		06/11/2018	619.89	72.80	547.09	
		09/17/2018	619.89	72.50	547.39	
		12/31/2018	619.89	73.70	546.19	
	04N23W20A01S	03/14/2018	488.89	26.50	462.39	
		06/11/2018	488.89	26.20	462.69	
		09/18/2018	488.89	27.10	461.79	
		12/03/2018	488.89	28.80	460.09	
	04N23W28G01S	03/14/2018	402.37	22.40	379.97	
		06/14/2018	402.37	25.60	376.77	
		09/17/2018	402.37	30.90	371.47	
		12/28/2018	402.37	29.70	372.67	
	04N23W29F02S	03/14/2018	396.58	47.00	349.58	
		06/11/2018	396.58	32.90	363.68	
		09/18/2018	396.58	48.10	348.48	
		12/03/2018	396.58	52.30	344.28	

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix C – Groundwater Level Measurement Data

Basin/Subbasin	SWN	Date	RP Elev.**	Depth***	WL Elev.**	Notes
Ventura River - Upper	04N23W33M03S	03/14/2018	331.80	19.30	312.50	
		06/11/2018	331.80	17.70	314.10	
		09/18/2018	331.80	22.60	309.20	
		12/03/2018	331.80	20.60	311.20	
	04N24W13J04S	03/05/2018	626.45	----	----	Inaccessible - too wet
		06/15/2018	626.45	7.90	618.55	
		09/17/2018	626.45	----	----	Could not measure this time.
		12/31/2018	626.45	----	----	Could not measure this time.
	04N24W13N01S	03/05/2018	642.12	----	----	Inaccessible - too wet
		06/15/2018	642.12	2.20	639.92	
		09/17/2018	642.12	----	----	Could not measure this time.
		12/31/2018	642.12	----	----	Could not measure this time.
	05N23W33B03S	03/05/2018	829.00	34.20	794.80	
		06/14/2018	829.00	----	----	Pumping
		09/19/2018	829.00	34.10	794.90	
		12/28/2018	829.00	----	----	Working on pump could not measure.
	05N23W33G01S	03/05/2018	816.21	24.90	791.31	
		06/14/2018	816.21	25.70	790.51	
		09/19/2018	816.21	----	----	Pumping
		12/28/2018	816.21	24.30	791.91	

* - Denotes basin key water level well
** - feet msl
*** - feet bgs

Appendix D – Water Quality Section

TABLES | Page

General Minerals Table D-1			
Mineral	Abbreviation	Reported Units	Laboratory Analytical Method
Boron	B	mg/l	EPA 200.7
Bicarbonate	HCO_3^-	mg/l	SM23320B
Calcium	Ca	mg/l	EPA 200.7
Copper	Cu	µg/l	EPA 200.7
Carbonate	CO_3^{2-}	mg/l	SM23320B
Chloride	Cl^-	mg/l	EPA 300.0
Electrical Conductivity	eC	µmhos/cm	SM2510B
Fluoride	F^-	mg/l	EPA 300.0
Iron	Fe	µg/l	EPA 200.7
Potassium	K	mg/l	EPA 200.7
Magnesium	Mg	mg/l	EPA 200.7
Manganese	Mn	µg/l	EPA 200.7
Nitrate	NO_3^-	mg/l	SM4500NO3F
Sodium	Na	mg/l	EPA 200.7
Sulfate	SO_4^{2-}	mg/l	EPA 300.0
Total Dissolved Solids	TDS	mg/l	EPA 200.7
Zinc	Zn	µg/l	EPA 200.7
pH	pH	units	SM4500-H B

Table D-1 General Minerals

Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Arroyo Santa Rosa Valley	02N19W19P02S	12/17/2018	0.2	330	66	ND	105	ND	1140	0.3	ND	1	63	30	62	67	109	710	ND	7.5
	02N19W20L01S	11/28/2018	0.2	410	84	ND	119	ND	1430	0.2	ND	ND	72	ND	76	75	169	960	ND	7.5
	02N20W23G03S	12/20/2018	0.1	300	63	ND	147	ND	1240	0.2	ND	1	64	ND	77	71	92.1	740	ND	7.4
	02N20W23R01S	12/20/2018	0.3	330	92	ND	182	ND	1550	0.3	ND	2	70	ND	100	114	194	990	ND	7.3
	02N20W25C06S	12/17/2018	0.3	250	60	ND	150	ND	1210	0.2	ND	1	49	ND	20.5	94	164	740	ND	7.3
Carpinteria	04N25W25N06S	11/19/2018	0.3	440	125	ND	100	ND	1580	0.6	ND	2	56	ND	9.3	104	315	1090	ND	7.0
	04N25W35G01S	11/19/2018	0.1	330	99	ND	49	10	906	0.2	ND	2	25	ND	10.6	55	118	540	ND	7.3
Fillmore	03N19W06D02S	11/14/2018	0.6	270	126	ND	66	ND	1400	0.6	ND	5	54	ND	16.1	94	414	1000	ND	7.5
	03N20W01F05S	08/22/2018	0.6	270	141	ND	63	ND	1420	0.7	ND	5	53	ND	15.8	97	451	1040	ND	7.6
	03N20W02R05S	11/14/2018	1.4	430	316	ND	218	ND	3000	0.5	ND	10	97	20	33.7	235	1030	2410	ND	6.8
	03N20W09D01S	11/14/2018	0.9	330	181	ND	81	ND	1770	0.5	ND	6	66	ND	40.7	115	565	1380	ND	7.2
	03N21W01P08S	09/11/2018	0.6	280	163	ND	50	ND	1480	0.5	ND	3	44	240	22.8	87	484	1080	ND	8.1
	04N19W31F01S	08/22/2018	0.7	260	137	ND	73	ND	1430	0.7	ND	5	53	ND	10.8	97	434	1010	ND	7.4
	04N20W32R03S	08/22/2018	0.4	270	153	ND	55	ND	1400	0.4	ND	3	34	10	38.2	90	415	980	ND	7.5
	04N20W36D07S	08/22/2018	0.7	300	157	ND	70	ND	1560	0.7	ND	5	61	60	12.5	98	497	1130	ND	7.8
	04N20W36P04S	08/22/2018	0.6	270	141	ND	57	ND	1410	0.7	ND	5	53	ND	19.5	96	443	1040	280	7.3
Las Posas Valley – East Las Posas Management Area	02N20W01Q01S	11/27/2018	0.8	290	153	ND	135	ND	1750	0.3	ND	3	37	ND	31.6	141	396	1210	ND	7.5
	02N20W04B01S	12/18/2018	ND	220	69	ND	14	ND	761	0.3	ND	4	23	120	ND	40	189	510	ND	7.5
	02N20W04F01S	12/18/2018	0.1	220	160	ND	91	ND	1310	0.3	210	5	39	430	ND	53	389	900	ND	7.4
	02N20W09Q07S	11/26/2018	0.7	260	192	ND	176	ND	2180	0.3	ND	5	60	230	24.2	181	614	1580	ND	7.4
	02N20W16B06S	11/27/2018	0.7	250	126	ND	160	ND	1880	0.4	70	5	51	50	ND	156	479	1300	ND	7.3
	03N19W29K06S	11/21/2018	ND	100	48	ND	45	ND	530	0.2	ND	1	8	ND	78.5	31	30.8	400	ND	6.8
	03N19W29K08S	11/21/2018	0.1	210	78	ND	28	ND	710	0.3	100	3	17	ND	15.8	44	128	470	20	7.3
	03N20W28J04S	11/26/2018	0.2	240	57	ND	39	ND	841	0.5	ND	3	29	ND	50.3	76	122	550	40	7.8
	03N20W34L02S	12/18/2018	ND	200	65	ND	12	ND	664	0.3	70	3	19	110	ND	36	157	440	ND	7.5
	03N20W36P01S	11/27/2018	ND	170	48	ND	19	ND	489	0.2	ND	2	9	ND	19.5	26	51.1	310	20	7.9

Table D-1 General Minerals (cont.)

Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	Zn	pH
Las Posas Valley – West Las Posas Management Area	02N20W17L01S	11/27/2018	0.6	260	159	ND	150	ND	1890	0.3	50	5	49	260	21.2	146	488	1300	ND	7.3
	02N21W08H03S	11/21/2018	0.3	300	73	ND	66	ND	1150	0.3	ND	3	29	30	16.4	105	220	750	ND	7.6
	02N21W09N01S	12/20/2018	0.3	280	67	ND	52	ND	845	0.2	ND	3	19	80	2.8	81	131	530	ND	7.7
	02N21W10G03S	11/16/2018	0.3	320	59	ND	51	ND	967	0.2	ND	4	22	ND	10.5	130	152	610	ND	7.7
	02N21W11A02S	11/16/2018	0.2	230	202	ND	120	ND	1800	0.3	ND	3	63	ND	170	98	404	1310	ND	7.4
	02N21W11A03S	11/16/2018	0.2	290	78	ND	34	ND	903	0.2	ND	4	30	50	0.6	79	180	600	20	7.8
	02N21W13A01S	11/27/2018	0.1	240	76	ND	13	ND	738	0.3	200	3	21	70	ND	52	156	480	ND	7.7
	02N21W15M04S	11/21/2018	0.4	280	110	ND	76	ND	1410	0.2	40	6	37	70	12.1	125	370	990	ND	7.5
	02N21W17F05S	11/16/2018	0.7	310	109	ND	64	ND	1500	0.2	ND	5	41	60	0.5	178	418	1060	ND	7.6
	02N21W18H14S	12/20/2018	0.4	300	78	ND	47	ND	1310	0.2	ND	6	35	50	ND	132	364	910	40	7.7
	03N20W32H03S	11/21/2018	0.2	340	138	ND	22	ND	1310	0.3	ND	5	42	410	ND	73	374	930	20	7.3
Ojai Valley	04N22W04Q01S	11/13/2018	ND	240	108	ND	28	ND	892	0.3	ND	3	32	ND	45.9	40	210	640	ND	7.6
	04N22W05H04S	11/20/2018	ND	270	125	ND	19	ND	912	0.2	ND	2	28	ND	17.9	32	208	630	20	7.1
	04N22W06J09S	11/20/2018	ND	270	123	ND	26	ND	916	0.2	ND	2	25	ND	20.4	33	201	640	ND	7.0
	04N23W01K02S	11/13/2018	ND	350	113	ND	48	ND	1030	0.5	ND	ND	28	ND	2.4	75	191	690	ND	7.1
	05N22W33J01S	11/15/2018	ND	300	149	ND	31	ND	1140	0.7	270	1	35	140	ND	48	315	820	20	7.0
Oxnard	01N21W04D04S	10/01/2018	0.4	300	65	ND	91	ND	1080	0.3	ND	8	25	70	ND	146	183	710	ND	7.7
	01N21W08R01S	10/01/2018	0.4	280	75	ND	56	ND	1160	0.2	ND	7	32	50	ND	137	281	780	ND	7.8
	01N21W21H02S	10/01/2018	0.4	260	46	ND	45	ND	974	0.2	ND	5	34	30	ND	127	220	660	ND	7.9
	01N21W22C01S	10/01/2018	0.3	270	65	ND	55	ND	878	0.2	ND	3	29	80	ND	94	162	590	ND	7.7
	01N21W28D01S	10/01/2018	0.4	280	85	ND	134	ND	1270	0.3	70	6	31	20	ND	150	242	860	ND	7.7
	01N22W03F05S	10/03/2018	0.7	250	143	ND	47	ND	1340	0.7	ND	5	48	30	15.9	106	415	990	ND	7.4
	01N22W03F07S	10/03/2018	0.8	310	224	ND	71	ND	1780	0.6	230	6	77	50	15.6	122	603	1520	140	7.4
	01N22W06R02S	12/20/2018	0.9	270	175	ND	72	ND	1820	0.6	ND	6	68	20	6	124	709	1390	ND	7.4
	01N22W16D04S	12/18/2018	0.7	220	121	ND	40	ND	1170	0.7	60	4	39	80	ND	85	351	830	ND	7.5
	01N22W21B06S	12/18/2018	0.4	270	67	ND	47	ND	1160	0.3	ND	7	34	80	0.4	117	290	760	ND	7.8
	01N22W24B04S	12/20/2018	0.7	230	120	ND	43	ND	1220	0.5	40	3	31	170	0.6	72	396	860	ND	7.5
	02N21W20Q05S	11/28/2018	0.6	280	91	ND	64	ND	1340	0.2	200	6	30	70	ND	128	346	910	ND	7.5
	02N22W24P02S	11/27/2018	0.6	240	125	ND	47	ND	1320	0.6	ND	4	39	ND	8.7	88	400	960	ND	7.5
	02N22W31B01S	12/20/2018	0.7	240	129	ND	56	ND	1450	0.7	ND	5	49	ND	24.4	105	492	1030	40	7.4
	02N22W36E02S	10/03/2018	0.7	240	139	ND	47	ND	1340	0.7	ND	4	45	ND	9	102	423	1000	ND	7.4
	02N22W36E05S	10/03/2018	1	290	223	ND	60	ND	2020	0.6	30	6	81	50	50.7	145	733	1680	ND	7.5
Piru	04N18W30J04S	09/11/2018	0.6	280	121	ND	116	ND	1540	0.5	ND	6	45	ND	26.8	123	396	1020	ND	7.5
	04N19W25M03S	09/11/2018	0.9	430	278	ND	72	10	2770	0.8	ND	6	116	540	46.8	158	1180	2360	ND	7.5
	04N19W26H01S	09/11/2018	0.7	280	134	ND	113	ND	1570	0.7	ND	5	53	ND	21.3	112	421	1110	ND	7.3
	04N19W26J02S	09/11/2018	1	440	231	ND	62	ND	2360	0.6	ND	5	91	230	28.3	134	916	1910	ND	7.1
	04N19W34J04S	11/14/2018	0.6	260	159	ND	70	ND	1570	0.7	ND	6	65	ND	70.6	90	483	1230	ND	7.2

Table D-1 General Minerals (cont.)

Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Pleasant Valley	01N21W01B05S	12/12/2018	0.3	370	60	ND	220	ND	1360	0.2	30	6	52	70	ND	135	56.1	800	ND	7.8
	01N21W03K01S	10/01/2018	0.4	240	172	ND	120	ND	1590	0.2	ND	5	48	ND	49.2	118	431	1180	ND	7.4
	01N21W03R01S	10/01/2018	0.6	310	251	ND	228	ND	2370	0.2	ND	6	80	20	45.2	200	704	1850	ND	7.2
	01N21W04K01S	10/01/2018	0.5	290	99	ND	116	ND	1380	0.4	ND	6	30	40	ND	164	291	920	ND	7.7
	01N21W10A02S	12/20/2018	0.5	270	333	ND	240	ND	2920	0.2	ND	5	88	1300	78.7	150	1080	2310	350	7.2
	01N21W10G01S	10/01/2018	0.4	270	195	ND	192	ND	1910	0.2	ND	4	62	140	14.5	136	510	1440	ND	7.3
	01N21W12D01S	12/12/2018	0.7	380	267	ND	330	ND	3100	0.1	120	5	111	220	ND	250	848	2340	ND	7.3
	01N21W15D02S	10/01/2018	0.5	290	174	ND	194	ND	1760	0.3	ND	5	56	200	1.4	164	458	1330	ND	7.4
	01N21W15H01S	12/12/2018	1.7	160	477	ND	660	ND	5550	ND	810	8	158	1700	ND	521	2270	4580	ND	7.2
	02N20W19L05S	12/12/2018	0.7	290	233	ND	146	ND	2290	0.2	ND	6	65	190	0.6	200	849	1750	ND	7.4
	02N20W29B02S	12/17/2018	0.2	340	70	ND	123	ND	1230	0.4	ND	3	51	50	5.2	100	164	750	ND	7.4
	02N21W33R02S	12/12/2018	0.4	280	89	ND	109	ND	1200	0.4	30	4	25	20	ND	130	209	760	ND	7.5
	02N21W34G01S	10/01/2018	0.8	370	98	ND	191	ND	1830	0.3	ND	7	32	30	ND	246	329	1180	ND	7.6
Santa Paula	02N22W03E01S	10/03/2018	0.6	360	301	ND	94	ND	2450	0.4	1070	6	89	540	0.9	193	923	2090	ND	7.1
Simi Valley	02N18W08D04S	09/05/2018	1.1	360	209	ND	163	ND	2340	0.5	ND	6	76	140	17.1	191	760	1830	ND	7.0
	02N18W08K07S	09/05/2018	1	300	260	ND	160	ND	2520	0.5	ND	5	77	ND	55.8	172	917	2070	ND	7.1
	02N18W09E01S	09/05/2018	0.8	290	193	ND	127	ND	2120	0.6	ND	4	68	ND	29.5	148	726	1650	ND	7.1
Tierra Rejada	02N19W10R02S	09/05/2018	0.1	260	51	ND	74	ND	938	0.4	ND	2	56	ND	10.9	56	172	700	ND	7.5
	02N19W11J03S	09/05/2018	0.2	270	56	ND	69	ND	989	0.2	ND	1	52	ND	24.5	52	172	670	30	7.6
	02N19W14F01S	09/05/2018	0.1	350	81	ND	120	ND	1270	0.2	ND	1	71	ND	71.6	48	137	840	ND	7.4
	02N19W14Q02S	09/05/2018	ND	340	51	ND	57	ND	992	0.1	ND	7	47	70	0.9	70	158	630	ND	7.7
	02N19W15B01S	09/05/2018	ND	270	74	ND	109	ND	1150	0.3	ND	1	57	20	11.7	54	198	760	ND	7.7
	02N19W15J02S	09/05/2018	0.2	390	70	ND	169	ND	1680	0.1	ND	5	84	ND	15.2	128	306	1180	ND	7.5
	02N19W15N03S	12/17/2018	ND	260	69	ND	84	ND	986	0.3	ND	2	59	ND	1	49	170	630	ND	7.6
Upper Ojai Valley	04N22W10K05S	11/13/2018	0.2	430	120	ND	93	ND	1140	0.4	ND	ND	28	1370	3.7	81	118	750	ND	6.9
	04N22W11J01S	11/15/2018	ND	190	66	ND	34	ND	654	0.4	50	ND	22	ND	47.2	32	78.2	430	30	6.5
	04N22W11P02S	11/15/2018	ND	260	40	ND	12	ND	452	ND	3510	ND	12	200	ND	45	0.9	250	110	7.4
Undefined	04N23W33M02S	11/19/2018	0.6	500	199	ND	153	ND	2020	0.3	ND	4	57	ND	ND	110	447	1460	ND	7.1
Ventura River – Lower	02N23W05K01S	11/19/2018	0.8	390	120	ND	175	ND	1860	0.6	ND	6	45	50	ND	157	360	1230	ND	7.6
Ventura River – Upper	04N23W09G03S	11/20/2018	0.5	370	149	ND	88	20	1240	0.3	ND	2	43	ND	40.5	65	180	830	50	7.1

California Title 22 Metals

Metals Table D-2			
Element Name	Element Symbol	Reported Units	Laboratory Analytical Method
Aluminum	Al	µg/l	EPA 200.8
Antimony	Sb	µg/l	EPA 200.8
Arsenic	As	µg/l	EPA 200.8
Barium	Ba	µg/l	EPA 200.8
Beryllium	Be	µg/l	EPA 200.8
Cadmium	Cd	µg/l	EPA 200.8
Chromium	Cr	µg/l	EPA 200.8
Lead	Pb	µg/l	EPA 200.8
Mercury	Hg	µg/l	EPA 245.1
Nickel	Ni	µg/l	EPA 200.8
Selenium	Se	µg/l	EPA 200.8
Silver	Ag	µg/l	EPA 200.8
Thallium	Tl	µg/l	EPA 200.8
Vanadium	V	µg/l	EPA 200.8

Radio Chemistry

Radio Chemistry Table D-3			
Name	Element Symbol	Reported Units	Laboratory Analytical Method
Gross Alpha		pCi/l	EPA 900.0
Uranium	U	pCi/l	EPA 908.0

Table D-2 Metals

Basin/Subbasin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Arroyo Santa Rosa Valley	02N20W23G03S	12/20/2018	ND	ND	3	33.6	ND	ND	8	ND	ND	1	4	ND	ND	76
Carpinteria	04N25W35G01S	11/19/2018	ND	ND	ND	65.5	ND	ND	2	ND	ND	ND	2	ND	ND	ND
Fillmore	04N20W32R03S	08/22/2018	ND	ND	ND	46	ND	ND	7	ND	ND	ND	7	ND	ND	3
	04N20W36D07S	08/22/2018	ND	ND	2	14.8	ND	ND	8	ND	ND	ND	11	ND	ND	5
Las Posas Valley – East Las Posas Management Area	03N19W29K08S	11/21/2018	10	ND	1	34.6	ND	ND	2	ND	ND	ND	6	ND	ND	11
	03N20W28J04S	11/26/2018	ND	ND	ND	47.8	ND	ND	7	ND	ND	ND	11	ND	ND	6
	03N20W34L02S	12/18/2018	ND	ND	ND	32.2	ND	ND	6	ND	ND	2	ND	ND	ND	ND
	03N20W36P01S	11/27/2018	ND	ND	2	62.5	ND	ND	4	ND	ND	ND	4	ND	ND	10
Las Posas Valley – West Las Posas Management Area	02N21W10G03S	11/16/2018	ND	ND	1	56.8	ND	ND	ND	ND	ND	ND	12	ND	ND	ND
	02N21W11A03S	11/16/2018	ND	ND	ND	44.8	ND	ND	ND	ND	ND	ND	1	ND	ND	ND
	02N21W13A01S	11/27/2018	ND	ND	ND	47.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	02N21W18H14S	12/20/2018	ND	ND	ND	37.8	ND	ND	3	ND	ND	1	1	ND	ND	ND
Ojai Valley	04N22W06K10S	11/20/2018	ND	ND	ND	51.2	ND	ND	2	ND	ND	ND	1	ND	ND	ND
	05N22W33J01S	11/15/2018	ND	ND	1	20.2	ND	ND	2	ND	ND	1	ND	ND	ND	ND
Oxnard	01N21W22C01S	10/01/2018	ND	ND	2	44.4	ND	ND	4	ND	ND	ND	ND	ND	ND	ND
	01N22W06R02S	12/20/2018	ND	ND	1	25.4	ND	ND	2	ND	ND	ND	7	ND	ND	3
	01N22W16D04S	12/18/2018	ND	ND	ND	20.5	ND	ND	6	ND	ND	1	ND	ND	ND	ND
	01N22W24B04S	12/20/2018	ND	ND	ND	29.7	ND	ND	2	ND	ND	2	1	ND	ND	ND
Piru	04N19W25M03S	09/11/2018	ND	ND	9	22.2	ND	0.9	25	ND	ND	5	466	ND	ND	10
Pleasant Valley	01N21W10G01S	10/01/2018	ND	ND	2	44	ND	ND	5	ND	ND	ND	10	ND	ND	4
	02N20W19L05S	12/12/2018	ND	ND	2	39.1	ND	ND	ND	ND	ND	4	11	ND	ND	ND
	02N21W33R02S	12/12/2018	ND	ND	ND	45	ND	ND	3	ND	ND	ND	2	ND	ND	ND
Simi Valley	02N18W08D04S	09/05/2018	ND	ND	2	14.2	ND	ND	9	ND	ND	2	15	ND	ND	5
Tierra Rejada	02N19W14F01S	09/05/2018	ND	ND	3	2.5	ND	ND	10	ND	ND	2	11	ND	ND	66
	02N19W15N03S	12/17/2018	ND	ND	5	10.4	ND	ND	2	ND	ND	1	1	1	ND	7
Upper Ojai Valley	04N22W10K05S	11/13/2018	ND	ND	3	116	ND	1.7	5	ND	ND	2	8	ND	ND	6
	04N22W11P02S	11/15/2018	ND	ND	2	264	ND	ND	2	ND	ND	ND	ND	ND	ND	ND

Appendix E – Piper Diagrams

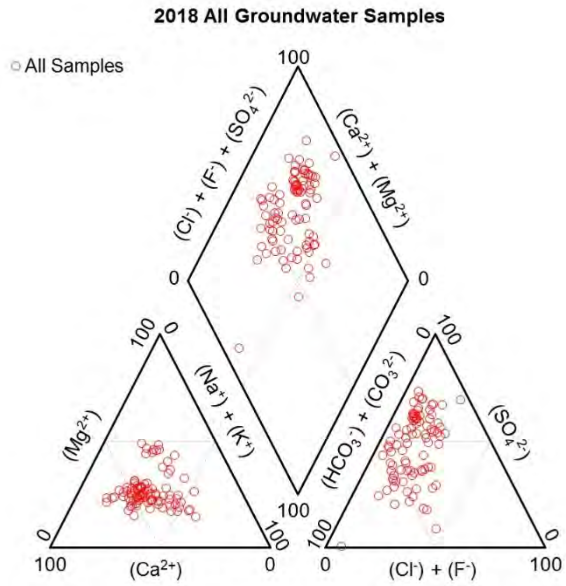

Figure E-1: Piper diagram for all samples.

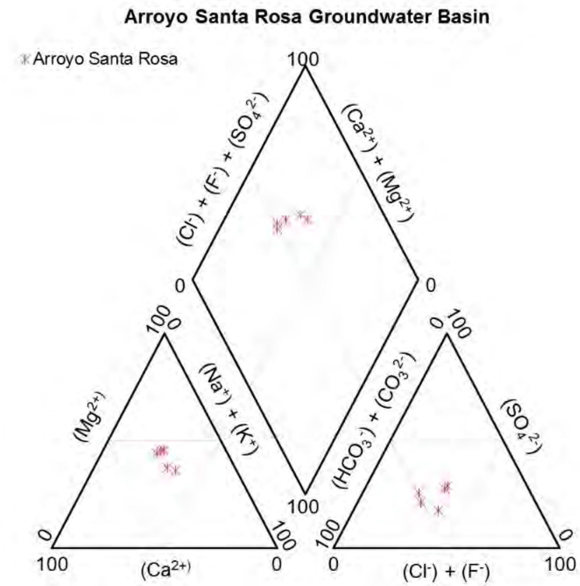

Figure E-2: Arroyo Santa Rosa Basin Piper diagram.

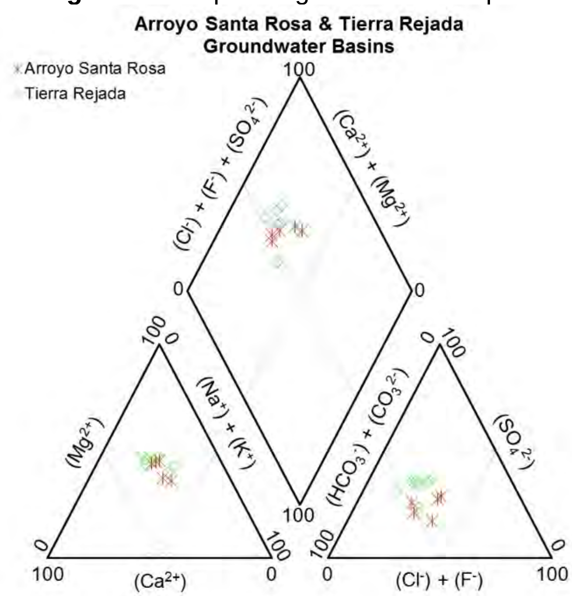

Figure E-3: Arroyo Santa Rosa & Tierra Rejada Basins Piper diagram.

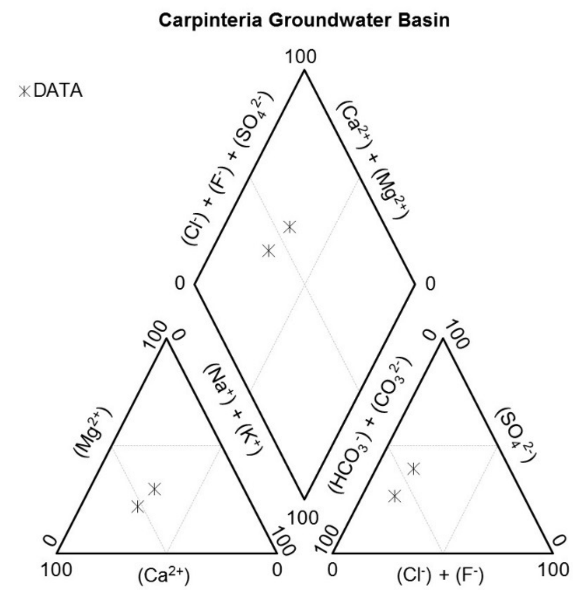

Figure E-4: Carpinteria Basin Piper diagram.

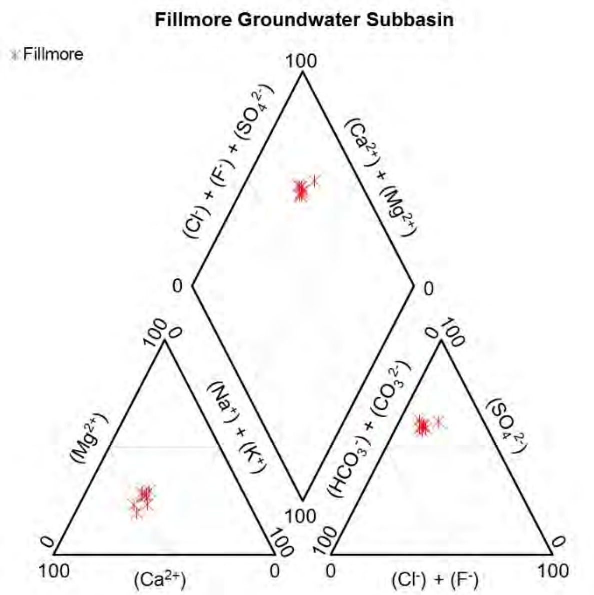

Figure E-5: Fillmore Subbasin Piper diagram.

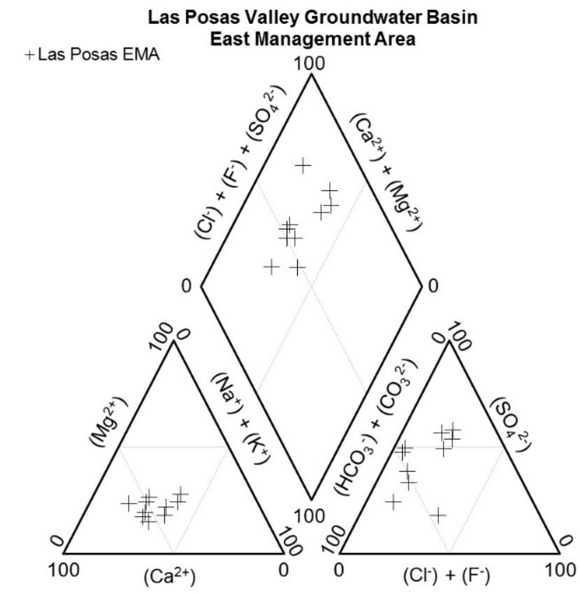

Figure E-6: Las Posas Valley EMA Piper diagram.

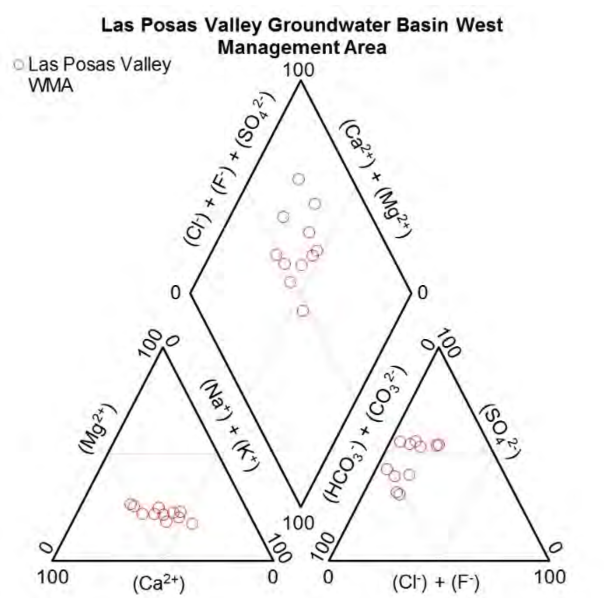

Figure E-7: Las Posas Valley WMA Piper diagram.

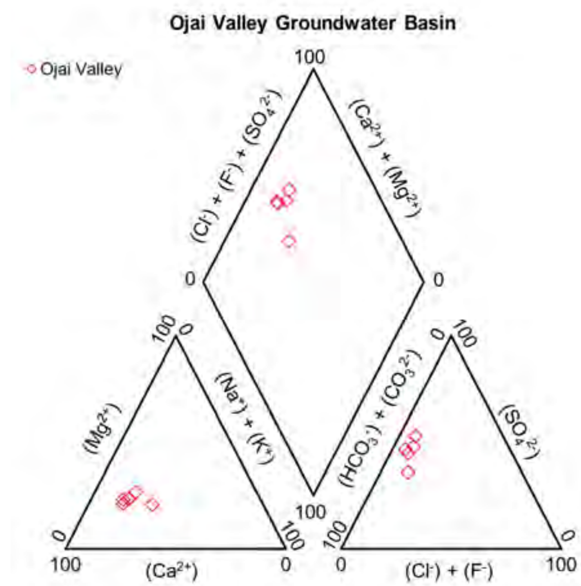

Figure E-8: Ojai Valley Basin Piper diagram.

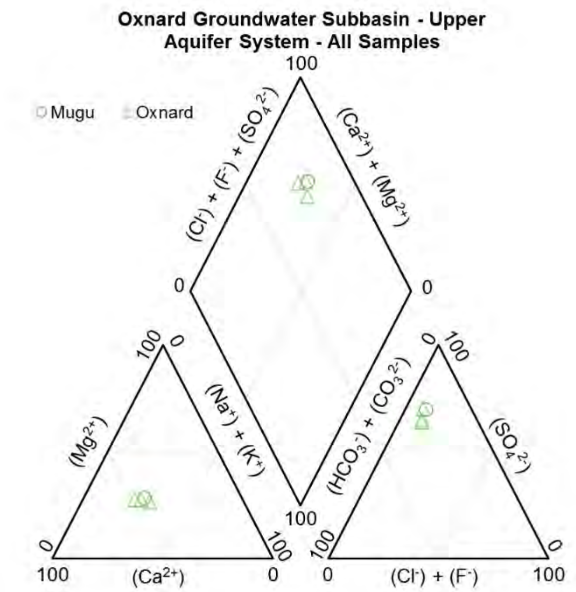

Figure E-9: All Upper Aquifer System Piper diagram.

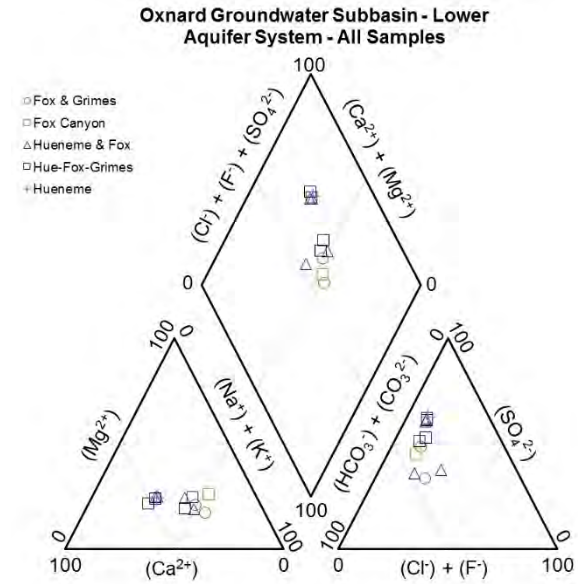

Figure E-10: All Lower Aquifer System Piper diagram.

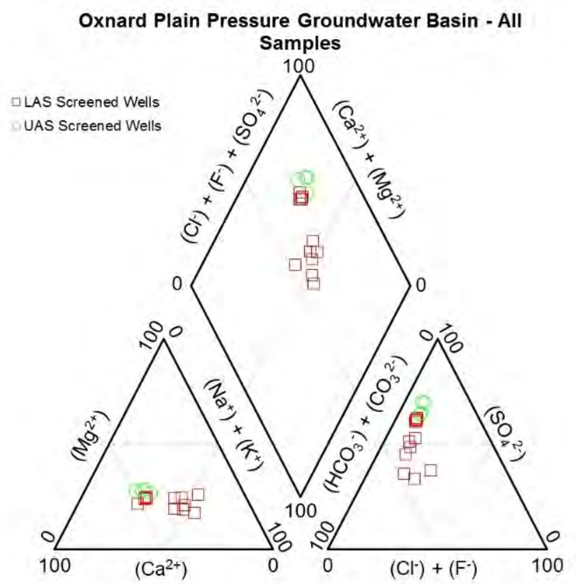

Figure E-11: Oxnard Subbasin Piper diagram all Samples.

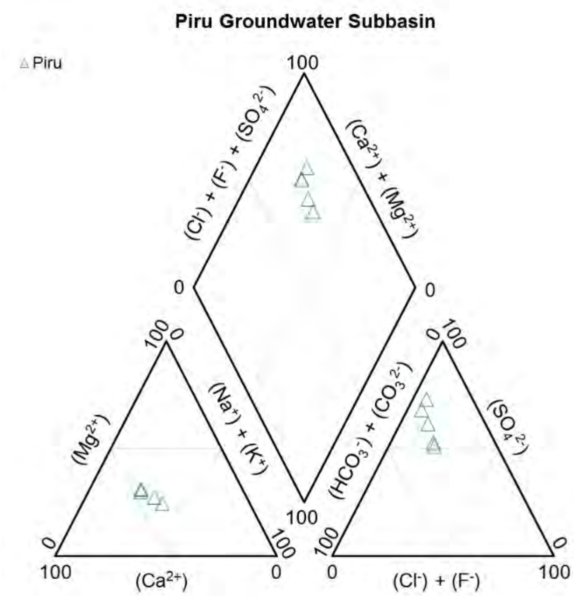

Figure E-12: Piru Subbasin Piper diagram.

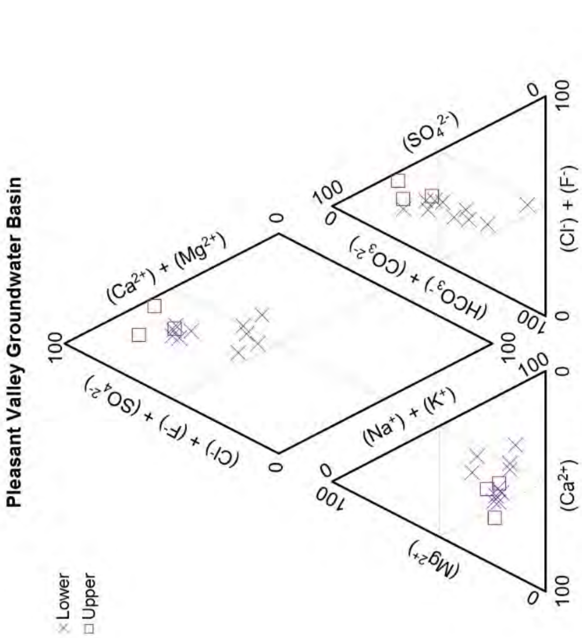

Figure E-13: Pleasant Valley Basin Piper diagram.

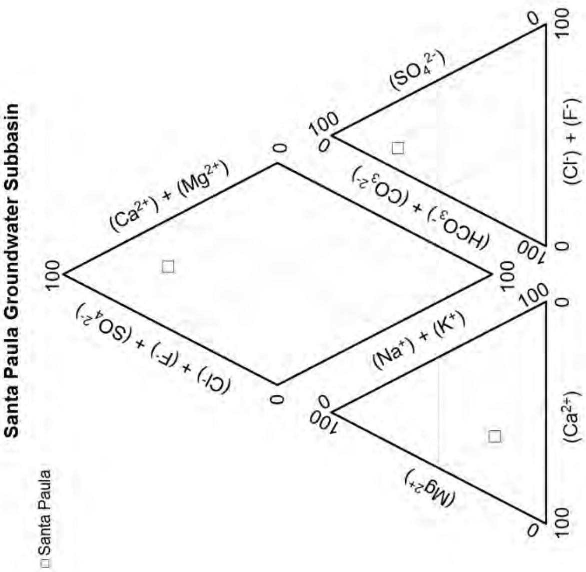

Figure E-14: Santa Paula Subbasin Piper diagram.

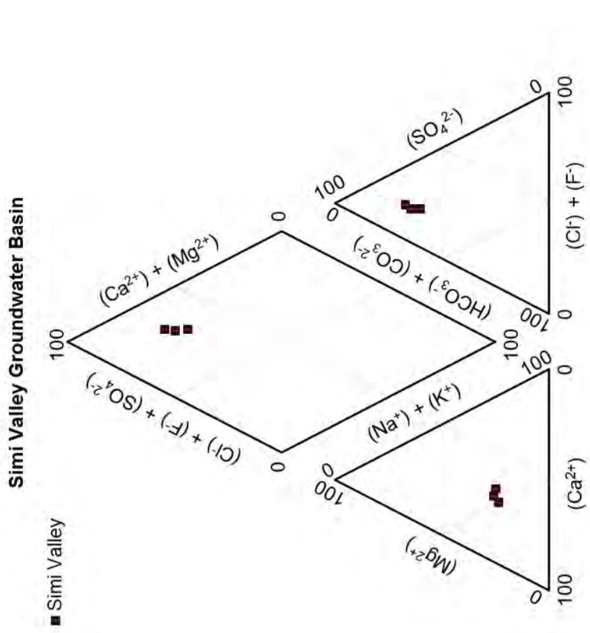

Figure E-15: Simi Valley Basin Piper diagram.

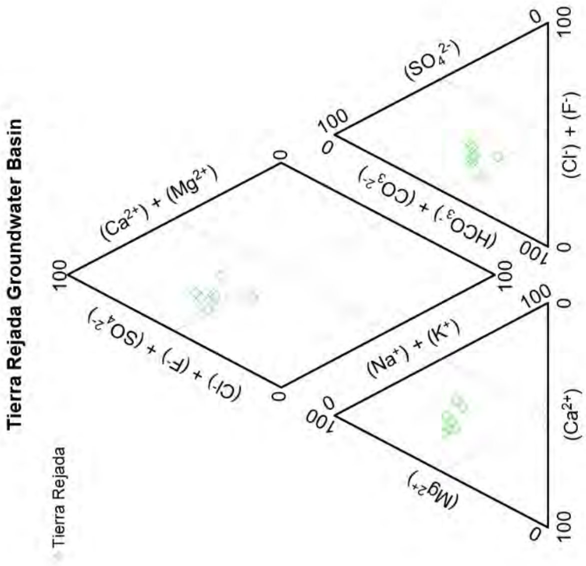

Figure E-16 Tierra Rejada Valley Basin Piper diagram.

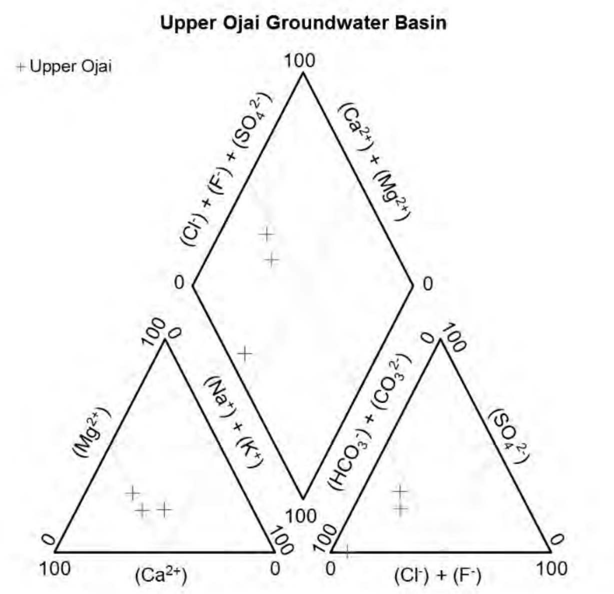

Figure E-17: Upper Ojai Basin Piper diagram.

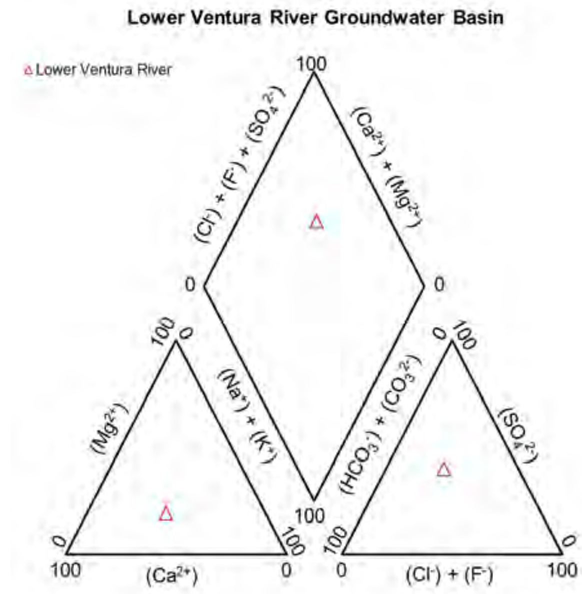

Figure E-18: Ventura River - Lower Subbasin Piper diagram.

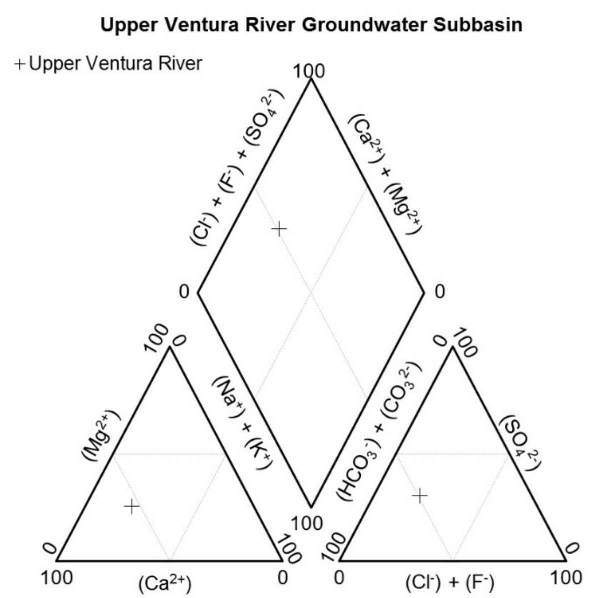

Figure E-19: Ventura River – Upper Subbasin Piper diagram.

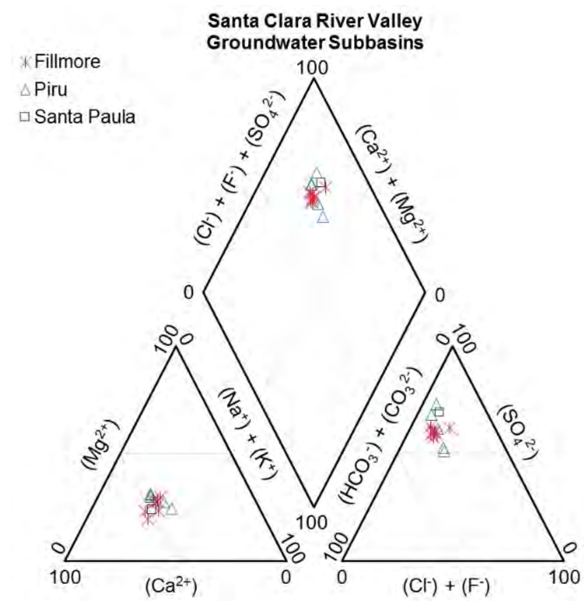

Figure E-20: Fillmore, Piru & Santa Paula Subbasins Piper diagram.

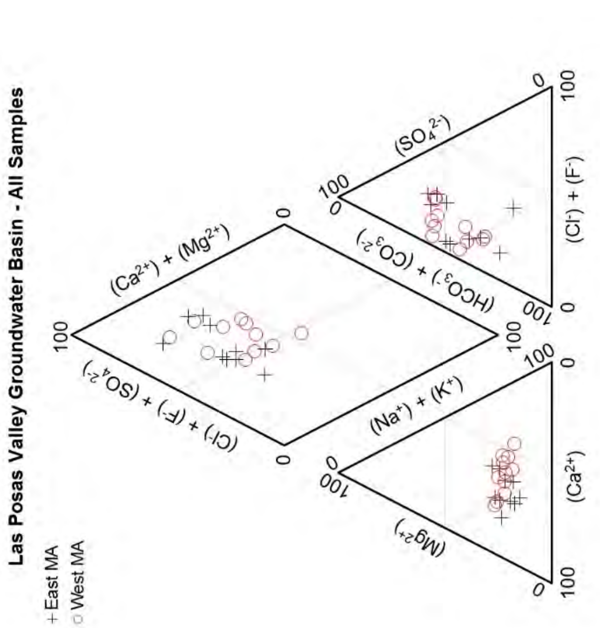

Figure E-21: Las Posas Valley Basin Piper diagram.

Appendix F - Basin Summary Sheets

The following basin summary sheets provide an overview of data, trends, and facts for groundwater basins in the County designated as high and medium priority in June of 2014 by the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. Trends for groundwater levels and groundwater quality were determined over the last five years for 2018. Trend analysis used sample sets with wells that were sampled or measured consistently over the five-year period where available. In some instances, this resulted in a small sample set. The spatial distribution of wells may not cover the entire groundwater basin. Data from VCWPD and other agencies was also used in the trend analysis.

Arroyo Santa Rosa Valley Basin

Groundwater Basin Surface Area:	3,270 acres
Irrigated Acreage:	≈1,755 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Arroyo Santa Rosa Valley Basin (4-7). Surface area 3,747 acres. (DWR, 2014)
SGMA Basin Priority:	Very Low
DWR Groundwater Basin Population:	2,434 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 77

Active: 38
Destroyed: 29
Abandoned: 3
Can't Locate: 7

2018 Self Reported Groundwater Extraction to FCGMA (as of July 18, 2019) (West part of basin only)

Agricultural Extractions - 1,173 AF/Yr Municipal, Industrial and Domestic - 0 AF/Yr

Water Demand Estimate (Whole basin)

Irrigation Demand @ 2 AF/Ac:3,510 AF/Yr

Municipal Demand @ 0.5 AF/person/Yr: 1,105 AF/Yr

Total Demand Estimate: 4,615 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N20W26B03S - December level was down 4.63 feet from the January measurement.

In general, for 3 wells measured in 2018 in the basin, water levels declined in 3 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County
(5 wells)

The water type of the samples is magnesium bicarbonate type

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 4 wells
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 5 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	No

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 02N20W26B03S: ↓

In general for 3 wells consistently measured: (2 wells) ↓ (1 well) ↑

5 Year Groundwater Quality Trend 2014-2018

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W19P02S	↓	→	↓	→
02N20W23G03S	→	↓	↓	↑
02N20W25C06S	→	↑	↓	→

Wells are generally in the southern central part of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Tierra Rejada basin. Surface flow percolation from Arroyo Santa Rosa and Conejo Creek. Waste water returns from residential onsite septic systems. (MWH, 2013)

Potable Water Sources

Groundwater from Arroyo Santa Rosa Basin. Imported State Water Project water from Metropolitan Water District via Calleguas Municipal Water District.

Non-Potable Water Source

Reclaimed water from Hill Canyon Waste Water Treatment Plant via Conejo Creek.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Arroyo Santa Rosa basin receive some subsurface inflow from Tierra Rejada basin. (MWH, 2013)

Downgradient: No

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (B-118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Fillmore Subbasin

Groundwater Basin Surface Area:	22,583 acres
Irrigated Acreage:	≈12,230 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Fillmore Subbasin (4-4.05). Surface area 22,583 acres. (DWR, 2006)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	16,240 (2010)

Known Water Supply Wells (as of July 2019)	**2018 Self Reported Groundwater Extraction to UWCD (as of July 19, 2019)**
Number of Wells: 596 Active: 444 Destroyed: 76 Abandoned: 25 Can't Locate: 47 Non-Compliant: 4	Agricultural Extractions: 38,785 AF/Yr Municipal Extractions: 2,229 AF/Yr Total Extractions: 41,014 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W05D01S - November level was down 15.7 feet from the March measurement.

In general, for the wells measured in the basin in 2018, water levels declined in 7 wells and rose in 1 well over the course of the year from the 1st quarter reading to the last quarter.

2018 Groundwater Quality in General for All Wells Sampled by County

(9 wells)

The water is calcium sulfate type in 9 samples.

Primary MCL Exceedances for Nitrate >45mg/L?	No
Secondary MCL Exceedances for Chloride >250mg/L	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 9 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 9 wells

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 03N20W05D01S: ↓

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is downward.

5 Year Groundwater Quality Trend 2014-2018

(*sampled by UWCD)

SWN	Nitrate	Chloride	TDS	Sulfate
03N20W02R05S	↓	↑	↓	↓
03N21W01P08S	↓	→	↓	↑
04N19W31F01S	↑	→	↓	↓
03N20W06D03S*	↑	→	↑	↑
04N19W30D01S*	↑	↑	↓	↑
04N20W33C03S*	↓	↓	→	↑

Wells are distributed throughout the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Piru basin. Surface flow percolation from Santa Clara River, Sespe Creek, and minor tributaries. (DWR, 2006) Imported State Water Project water via Lake Piru release to Santa Clara River.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Piru groundwater basin.
Downgradient: Yes, Santa Paula groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Many groundwater quality impairments in the basin; Nitrates problematic during dry periods; High TDS, etc. (B-118). REH – Public comment indicated WQ is localized and being managed

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Las Posas Valley Basin East Management Area

Management Area Name:	East Las Posas Management Area
ELPMA Surface Area:	27,180 acres
Irrigated Acreage:	≈10,000 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Los Posas Valley Basin (4-8). Surface area 42,353 acres. Note: DWR groups three County basins into Las Posas Valley Basin (4-8) (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	42,721 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 457
Active: 167
Destroyed: 172
Abandoned: 43
Can't Locate: 71
Non-Compliant: 4

2018 Self Reported Groundwater Extraction to FCGMA (as of Aug. 16, 2019)

Agricultural Extractions: 20,819 AF/Yr

Municipal, Industrial, and Domestic Extractions: 1,815 AF/Yr

Total: 22,634 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W26R03S - December level was down 16.1 feet from the March measurement.

In general, for 12 wells measured in 2018 in the basin, water levels declined in 11 wells and rose in 1 well over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(10 wells)

The water type in 7 samples is calcium sulfate type and the remaining 3 samples are calcium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 2 wells
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 6 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 4 wells

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 03N20W26R03S: ↓

The 5 year trend based on 2014 through 2018 groundwater level elevation maps varies.

The majority of the wells in the basin show a downward trend while only 2 of the wells show a rising trend.

5 Year Groundwater Quality Trend 2014-2018

SWN	Nitrate	Chloride	TDS	Sulfate
02N20W09Q07S	↓	→	↑	↓
02N20W16B06S	↓	↓	↓	↓
03N19W29K08S	→	→	↓	↓
03N19W29K06S	↑	→	↑	↑

Two wells are located in the southwest, two wells are located in the northeast.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas. (DWR, 2006) Imported State Water Project water via injection in the Calleguas Municipal Water District ASR well field.

Potable Water Sources

Groundwater from East Las Posas basin. Imported State Project Water from Calleguas MWD to various purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

West: Possible connection to West Las Posas basin in NW part of

basin. South/Southeast: South Las Posas Basin.

Southwest: Restrictive subsurface structure between Pleasant Valley basin and East Las Posas basin may cause spillover from East Las Posas to Pleasant Valley when basin is full.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin. Public Comment includes reports of subsidence, overdraft and saline intrusion.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Las Posas Valley Basin West Management Area

Management Area Name:	West Las Posas Management Area (WLPMA)
WLPMA Surface Area:	17,442 acres
Irrigated Acreage:	≈9,950 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Los Posas Valley Basin (4-8). Surface area 42,353 acres. Note: DWR groups three County basins into Las Posas Valley Basin (4-8) (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	42,721 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 192
Active: 91
Destroyed: 70
Abandoned: 11
Can't Locate: 19
Non-Compliant: 1

2018 Self Reported Groundwater Extraction to FCGMA (as of Aug. 16, 2019)

Agricultural Extractions: 12,329 AF/Yr

Municipal, Industrial, and Domestic Extractions: 1,927 AF/Yr

Total: 14,256 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N21W11J04S - December level was down 3.7 feet from the January measurement.

In general, for 14 wells measured in 2018 in the basin, water levels declined in 9 wells and rose in 5 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County
(11 wells)

The water type in 7 samples is calcium sulfate type, 3 samples are calcium bicarbonate type, 1 sample is sodium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 1 well
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 10 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 6 wells

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 02N21W11J04S: ↓

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is downward.

5 Year Groundwater Quality Trend 2014-2018

SWN	Nitrate	Chloride	TDS	Sulfate
02N21W15M04S	↑	↑	↑	↑
02N21W17F05S	→	↓	↓	↓
02N21W11A03S	↓	→	↓	↓
02N21W13A01S	→	→	→	↑

Wells are in various locations in the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas. (DWR, 2006)

Potable Water Sources

Groundwater from West Las Posas basin. State Water Project water from Calleguas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

East: Possible connection to East Las Posas basin in NW part of basin.

Southwest: Yes, Oxnard Plain Pressure basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin. Public Comment includes reports of subsidence, overdraft and saline intrusion.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Mound Subbasin

Groundwater Basin Surface Area:	13,864 acres
Irrigated Acreage:	≈2,075 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Mound Subbasin (4-4.03) Surface area 13,864 Acres. (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	75,298 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 90
Active: 32
Destroyed: 43
Abandoned: 6
Can't Locate: 8
Non-Compliant: 1

2018 Self Reported Groundwater Extraction to UWCD (as of July 19, 2019)

Agricultural Extractions: 3,341 AF/Yr

Municipal & Industrial Extractions: 2,662 AF/Yr

Total Extractions: 6,003 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N22W07M02S (measured by UWCD) - November level was down 13.2 feet from the January measurement.

In general, for 2 wells consistently measured in the basin in 2018, water levels declined in both wells over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(no wells sampled in 2018)

Primary MCL Exceedances for Nitrate >45mg/L?
Secondary MCL Exceedances for Chloride >250mg/L?
Secondary MCL Exceedances for TDS >500mg/L?
Secondary MCL Exceedances for Sulfate >250mg/L?

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 02N22W07M02S: ↓

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is downward.

5 Year Groundwater Quality Trend 2014-2018

(Based on wells sampled by other agencies) (D=Deep aquifer S=Shallow aquifer)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W08F01S (D)	↑	→	↑	↑
02N22W08G01S (D)	↓	→	↓	↓
02N22W07M02S (D)	→	↓	↑	→
02N22W09L03S (D)	→	↓	→	→
02N23W15J02S (D)	→	↑	→	↓
02N22W07M03S (S)	↓	→	→	↓
02N22W09L04S (S)	→	→	↓	→
02N23W15J03S (S)	→	↑	↑	↓

Wells are generally in the center of the basin along an east to west line.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Santa Paula basin. Surface flow percolation from Santa Clara River and, percolation of direct precipitation into the San Pedro Formation which crops out along the northern edge of the subbasin. (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Mound Basin, Ventura River Basin, Oxnard Plain Pressure Basin via Ventura Water System. Surface water from Ventura River diversion via Ventura Water System. Surface water from Lake Casitas via Casitas Municipal Water District to Ventura Water System.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Santa Paula groundwater basin.

East/Southeast: Yes, Oxnard Plain Forebay and Oxnard Plain Pressure groundwater basins. Flow into and out of basin dependent on groundwater levels.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (B-118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Ojai Valley Basin

Groundwater Basin Surface Area:	6,470 acres
Irrigated Acreage:	≈2,135 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Ventura River
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Ojai Valley Basin (4-2). Surface area 6,851 acres. (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	7,745 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 330
Active: 189
Destroyed: 82
Abandoned: 9
Can't Locate: 49
Non-Compliant: 1

2018 Self Reported Groundwater Extractions to OBGMA

Extractions: 4,159 Af/Yr

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac:4,270 AF/Yr

Municipal Demand @ 0.5AF/person/Yr: 4,134 AF/Yr

Total Demand Estimate: 8,404 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N22W05L08S: - The December reading was down 9.9 feet from the March level.

In general, for 15 wells consistently measured in 2018 in the basin, water levels declined in 10 wells and rose in 5 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(5 wells)

Ojai Valley groundwater: 1 sample is calcium bicarbonate type, and 4 samples are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	1 well
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 5 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 1 well

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 04N22W05L08S: ↑

In general, for 16 wells consistently measured: (16 wells) ↑

5 Year Groundwater Quality Trend 2014-2018

SWN	Nitrate	Chloride	TDS	Sulfate
04N23W01K02S	→	↓	↓	↑
05N22W33J01S	↑	↓	↓	↓
04N22W04Q01S	→	↑	↓	↑

Wells are located in various areas of the basin.

Sources of Groundwater Recharge

Basin Recharge: infiltration of precipitation on the valley floor, and percolation of surface waters through alluvial channels. (DWR, 2006)

Potable Water Sources

Groundwater from Ojai Valley Basin. Surface water from Lake Casitas via Casitas Municipal Water District to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No

Downgradient: No. The basin is drained by Thacher and San Antonio Creeks to the Ventura River. (DWR, 2006)

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: High nitrates and sulfates reported in the basin. Medium to high levels of nitrates reported in the basin

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Forebay Management Area

Management Area Name:	Forebay Management Area
Forebay Management Area Surface Area:	5,811 acres
Irrigated Acreage:	≈1,797 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined and confined
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Oxnard Subbasin (4-4.02) Surface area 57,642 Acres. Note: DWR groups two County basins into Oxnard Subbasin (4-4.02) (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	237,466 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 280
Active: 108
Destroyed: 133
Abandoned: 15
Can't Locate: 28
Non-Compliant: 1

2018 Self Reported Groundwater Extraction to FCGMA (as of August 20, 2019)

Agricultural Extractions: 6,475 AF/Yr

Municipal, Industrial, and Domestic Extractions: 12,558 AF/Yr

Total: 19,033 AF/yr

2018 Groundwater Levels in General for Wells Gauged by County and UWCD

"Key" well 02N22W12R04S - (Oxnard Aquifer) - Note: Measurements from UWCD. Well was dry all of 2018.

No wells measured by VCWPD in 2018.

2018 Groundwater Quality in General for All Wells Sampled by County
(0 wells)

Forebay Management Area: No wells sampled in 2018

Primary MCL Exceedances for Nitrate >45mg/l?
Secondary MCL Exceedances for Chloride >250mg/l?
Secondary MCL Exceedances for TDS >500mg/l?
Secondary MCL Exceedances for Sulfate >250mg/l?

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 02N22W12R04S: Well is dry as of December 2018 measurement. This is an upper system well.

Upper System ↓

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is downward.

Lower System ↓

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is downward.

5 Year Groundwater Quality Trend 2014-2018

Upper System (Includes wells sampled by other agencies)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W23B02S	↓	→	→	↓
02N22W23G03S	→	→	→	→
02N22W26E01S	↓	↑	↑	↑
02N22W11J01S	→	↓	→	↓

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W13N02S	→	→	↑	→
02N22W23H04S	→	→	↑	↑
02N22W26B03S	→	→	↓	↓

Wells are located in the southeast portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: percolation of surface flow from the Santa Clara River and, some subsurface flow from Santa Paula Subbasin makes its way over or across the Oak Ridge fault. Some amount of irrigation return also occurs (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Oxnard Plain Forebay basin. Surface water from Santa Clara River diversion via United Water Conservation District. Groundwater from Oxnard Plain Pressure basin via Oxnard Water System. Imported State Project Water from Calleguas MWD via Oxnard Water System.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Santa Paula groundwater basin to the northwest and Oxnard Plain groundwater basin to the east and south.

Downgradient: Yes, Mound groundwater basin to the southwest. Oxnard Plain Pressure groundwater basin to the south and southwest. Flow into and out of Mound

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Saline intrusion, nitrates, pesticides, and PCBs have impacted some water wells per (B-118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Oxnard Subbasin

Irrigated Acreage:	≈21,540 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River and Calleguas Creek
Aquifers:	Unconfined and confined aquifers
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	237,466 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 1,180
Active: 469
Destroyed: 533
Abandoned: 75
Can't Locate: 97
Non-Compliant: 6

2018 Self Reported Groundwater Extraction to FCGMA (as of August 20, 2019)

Agricultural Extractions: 45,712 AF/Yr

Municipal, Industrial, and Domestic Extractions: 24,758 AF/Yr

Total: 70,470 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

UAS "Key" well 01N21W07H01S - December level was down 7.06 feet from the March measurement.

LAS "Key" well 01N21W32K01S - December level was down 6.4 feet from the January measurement.

In general, for 20 wells consistently measured in 2018 in the basin, water levels declined in 18 wells and rose in 2 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(16 wells)

UAS - Oxnard Pressure basin groundwater: Oxnard aquifer samples are calcium sulfate type. Mugu aquifer samples are calcium sulfate type.

LAS - Oxnard Pressure basin groundwater: Hueneme aquifer samples are calcium sulfate type. Fox Canyon aquifer samples are mainly calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 1 wells
Secondary MCL Exceedances for Chloride >250mgL?	Yes, 0 wells
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 16 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 12 wells

5 Year Groundwater Level Trend 2014 - 2018

UAS "Key" well 01N21W07H01S: ↓

LAS "Key" well 01N21W32K01S: ↑

Upper System

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is downward.

Lower System

The 5 year trend based on 2014 through 2018 groundwater level elevation is mixed with most wells trending upward.

5 Year Groundwater Quality Trend 2014-2018

Upper System

SWN	Nitrate	Chloride	TDS	Sulfate
01N22W03F07S	↓	↑	↑	↑
01N21W31A08S	→	→	→	→

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W08R01S	→	→	→	→
01N21W28D01S	→	→	↓	↑
01N22W03F05S	→	→	↓	↓
01N22W16D04S	→	↑	↑	↑
02N21W20Q05S	→	→	↓	↓
02N22W36E02S	↑	↑	→	↓

For upper system, both wells are in the northwest. For lower system the wells are generally in the center of the basin along a northeast to southwest line, and a small group in the southeast.

Sources of Groundwater Recharge

Basin Recharge: percolation of surface flow from the Santa Clara River, into the Oxnard Forebay; precipitation and floodwater from the Calleguas Creek drainage percolate into the unconfined gravels near Mugu Lagoon. Some underflow may come from the Las Posas and Pleasant Valley Basins on the east. Flow into and out of Mound basin dependent on water levels. (DWR, 2006). Imported State Water Project water via Lake Piru release to Santa Clara River

Potable Water Sources

Groundwater from Oxnard Plain Pressure Basin via various purveyors. Groundwater from Oxnard Forebay basin via United Water system. Surface water from Santa Clara River via United Water System. Imported State Water Project water from Calleguas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

North: Oxnard Forebay basin, Mound basin

East/Northeast: Pleasant Valley basin, West Las Posas basin

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Saline intrusion, nitrates, pesticides, and PCBs have impacted some water wells per (B-118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Piru Subbasin

Groundwater Basin Surface Area:	10,896 acres
Irrigated Acreage:	≈5,600 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Piru Subbasin (4-4.06). Surface area 10,896 acres. (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	2,744 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 152
Active: 121
Destroyed: 21
Abandoned: 2
Can't Locate: 6
Non-Compliant: 2

2018 Self Reported Groundwater Extraction to UWCD (as of July 19, 2019)

Agricultural Extractions: 11,129 AF/Yr

Municipal Extractions: 472 AF/Yr

Total Extractions: 11,601 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N19W25C02S - December level was down 12.3 feet from the March measurement.

In general, for 5 wells consistently measured in 2018 in the basin, water levels declined in all 5 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(5 wells)

Piru basin groundwater is mainly calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 2 wells
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 5 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 5 wells

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 04N19W25C02S: ↑

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is mixed with most wells showing an upward trend.

5 Year Groundwater Quality Trend 2014-2018

(* sampled by UWCD)

SWN	Nitrate	Chloride	TDS	Sulfate
04N18W30J04S	↓	↑	↑	↑
04N19W26H01S	→	→	↓	→
04N19W34J04S	↑	↑	↑	↑
04N19W25M03S	↑	↑	↓	↓
04N18W20R01S*	↑	↑	↑	↑
04N18W27B01S*	→	↑	↑	↑
04N18W20M03S*	↑	↑	↑	↑

The wells are in the north central portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from East basin. Surface flow percolation from Santa Clara River, Piru Creek and Hopper Creek. (DWR, 2006) Imported State Water Project water via Lake Piru release to Santa Clara River and percolation ponds.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, East groundwater basin.
Downgradient: Yes, Fillmore groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

DWR Impact Comments: GW Quality impacts: nitrates, storm runoff, leaking tanks, etc. (B-118). High Selenium and other inorganics, average TDS was 1450 mg/l (Ventura Co 2011 annual gw report)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Pleasant Valley Basin

DWR Groundwater Basin Designation and Size:	Pleasant Valley Basin (4-6). Surface area 19,838 acres. (DWR, 2014)
Groundwater Basin Surface Area:	20,267 acres
Irrigated Acreage:	≈7,980 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	66,391 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 341
Active: 86
Destroyed: 180
Abandoned: 27
Can't Locate: 41
Non-Compliant: 7

2018 Self Reported Groundwater Extraction to FCGMA (as of July 18, 2019)

Agricultural Extractions: 9,430 AF/Yr

Municipal, Industrial, and Domestic Extractions: 4,350 AF/Yr

Total: 13,780 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 01N21W03C01S - December level was down 5.3 feet from the January measurement.

In general, for 11 wells consistently measured in 2018 in the basin, water levels declined in 10 wells and rose in one well over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(13 wells)

Pleasant Valley basin groundwater: 1 sample is sodium sulfate type, and 12 samples are calcium sulfate type

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 3 wells
Secondary MCL Exceedances for Chloride >250mg/L?	Yes, 2 wells
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 13 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 12 wells

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 01N21W03C01S: ↓

Upper System

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is downward.

Lower System

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is mixed with 6 wells trending downward and 5 wells trending upward.

5 Year Groundwater Quality Trend 2014-2018

Upper System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W15H01S	→	→	↑	↑
01N21W10A02S	↑	↓	→	↑

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W03K01S	↑	↓	↓	↑
01N21W03R01S	↑	→	↑	↑
01N21W04K01S	→	↓	↓	↓
01N21W10G01S	↑	↑	↑	↑
01N21W15D02S	→	→	→	↑
02N21W34G01S	→	→	↓	↓

One well is in the north central portion, the remaining are in the southwest.

Sources of Groundwater Recharge

Basin Recharge: dominantly from subsurface flow across the Springville fault zone. A modest amount of irrigation water and septic system effluent also contribute to basin recharge. (DWR, 2006)

Potable Water Sources

Groundwater from Pleasant Valley Basin, groundwater from Arroyo Santa Rosa basin via Camrosa Water District. Imported State Water Project water from Calleguas Municipal Water District to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

West: Yes, Oxnard Plain Pressure Basin.

East: No.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: PC - Discharge of poor quality GW from dewatering wells and effluent discharge from the wastewater treatment facility into the Arroyo Simi have led to rising water levels in the basin along with higher TDS and Chloride levels.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Santa Paula Subbasin

Groundwater Basin Surface Area:	22,110 acres
Irrigated Acreage:	≈9,100 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Santa Paula Subbasin (4-4.04) Surface area 22,110 Acres. (DWR, 2014)
SGMA Basin Priority:	Very Low
DWR Groundwater Basin Population:	47,755 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 330
Active: 179
Destroyed: 90
Abandoned: 14
Can't Locate: 47

2018 Self Reported Groundwater Extraction to UWCD (as of July 19, 2019)

Agricultural Extractions: 15,601 AF/Yr

Municipal & Industrial Extractions: 7,469 AF/Yr

Total Extractions: 23,070 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N22W02C01S - December level was down 3.3 feet from the March measurement.

In general, for 7 wells measured in 2018 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(1 wells)

The water type for the sample is calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	No
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 1 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 1 wells

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 02N22W02C01S: ↓

The 5 year trend based on 2014 through 2018 groundwater level elevation maps is mixed with most wells showing a downward trend.

5 Year Groundwater Quality Trend 2014-2018

(Based on 5 wells sampled by other agencies)

SWN	Nitrate	Chloride	TDS	Sulfate
03N21W15C06S	→	↑	↑	↑
03N21W15G03S	→	↓	→	→
03N21W16A02S	→	↓	→	↓
03N21W16H06S	↑	→	↑	↑
03N22W35Q01S	↑	↑	↓	↑

One well is in the southwest portion of the basin and 4 wells are in the northeast end of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Fillmore basin. Surface flow percolation from Santa Clara River, and Santa Paula Creek (DWR, 2006) Imported State Water Project water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Santa Paula Basin

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Fillmore groundwater basin.
Downgradient: Yes, Mound and Oxnard Plain Forebay groundwater basins

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Nitrates can fluctuate significantly in the basin, and above MCL. Other inorganics present above MCL.TDS is known to be high.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Tierra Rejada Basin

Groundwater Basin Surface Area:	1,774 acres
Irrigated Acreage:	≈450 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Tierra Rejada (4-15) Surface area 4,611 Acres. (DWR, 2014)
SGMA Basin Priority:	Very Low
DWR Groundwater Basin Population:	3,758 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 58
Active: 37
Destroyed: 8
Abandoned: 1
Can't Locate: 12

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac: 900 AF/Yr

Municipal Demand @ 0.5AF/person/Yr: 1,834 AF/Yr

Total Demand Estimate: 2,734 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

No key well is in this basin.

In general, for 3 wells measured in 2018 in the basin, water levels increased over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(7 wells)

Tierra Rejada groundwater: 1 sample is magnesium bicarbonate type, 6 samples are magnesium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 1 well
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 7 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 1 wells

5 Year Groundwater Level Trend 2014 - 2018

In general for 3 wells consistently measured: (2 wells) ↓ (1 well) ↑

5 Year Groundwater Quality Trend 2014-2018

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W10R02S	→	→	→	→
02N19W11J03S	↑	→	↓	↓
02N19W14F01S	→	↑	→	↑
02N19W15J02S	↓	↑	↑	↑

Wells are in various locations in the basin.

Sources of Groundwater Recharge

Basin Recharge: Percolation of rainfall to the valley floor, stream flow, and irrigation return.(DWR, 2006)

Potable Water Sources

Groundwater from Tierra Rejada Basin, Arroyo Santa Rosa Basin via Camrosa Water District. State Water Project water from Calleguas Municipal Water District via Camrosa Water District.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No

Downgradient: Yes, some subsurface flow into Arroyo Santa Rosa basin.

DWR CASGEM Groundwater Basin Prioritization Level - Very Low

Impact Comments: Locally high nitrates documented in the basin (B-118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Upper Ventura River Subbasin

Groundwater Basin Surface Area:	9,360 acres
Irrigated Acreage:	≈1,206 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Ventura River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Ventura River Valley Basin, Upper Ventura River Subbasin (4-3.01) Surface area 7,430 acres. (DWR, 2014)
SGMA Basin Priority:	Medium
DWR Groundwater Basin Population:	10,307 (2010)

Known Water Supply Wells (as of July 2019)

Number of Wells: 202
Active: 121
Destroyed: 33
Abandoned: 10
Can't Locate: 32
Non-Compliant: 6

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac: 2,412 AF/Yr

Municipal Demand @ 0.5AF/person/Yr: 7,980 AF/Yr

Total Demand Estimate: 10,392 AF/Yr

2018 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N23W16C04S - December level was down 12.8 feet from the March measurement.

In general, for wells measured in 2018 in the basin, water levels declined in 5 wells and rose in 5 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2018 Groundwater Quality in General for All Wells Sampled by County

(1 well)

Upper Ventura River basin: The groundwater in the sample is calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes
Secondary MCL Exceedances for Sulfate >250mg/L?	No

5 Year Groundwater Level Trend 2014 - 2018

"Key" well 04N23W16C04S: ↓

In general for 12 wells consistently measured: (9 wells) ↓ (3 well) ↑

5 Year Groundwater Quality Trend 2014-2018

(*sampled by other agency)

SWN	Nitrate	Chloride	TDS	Sulfate
04N23W09G03S	↑	↑	↓	→
03N23W05P02S*	→	→	↑	↑
03N23W08C02S*	↓	↓	↑	↑

1 wells is in the north and 2 wells are in the south portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: percolation of flow in the Ventura River and, to a lesser extent, by percolation of rainfall to the valley floor and excess irrigation water. (DWR, 2006)

Potable Water Sources

Groundwater from Lower Ventura River basin. Surface water from Lake Casitas via Casitas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No.
Downgradient: Lower Ventura River basin.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: TDS is known to be high in some parts of the basin (B-118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trendingdown ↓